MiniMax Plus and PowerMax

POOL & SPA HEATERS

OPERATION & INSTALLATION MANUAL

⚠WARNING

FOR YOUR SAFETY - READ BEFORE OPERATING

Warning: If you do not follow these instructions exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.
For additional free copies of this manual; call (800) 831-7133.

PacFab
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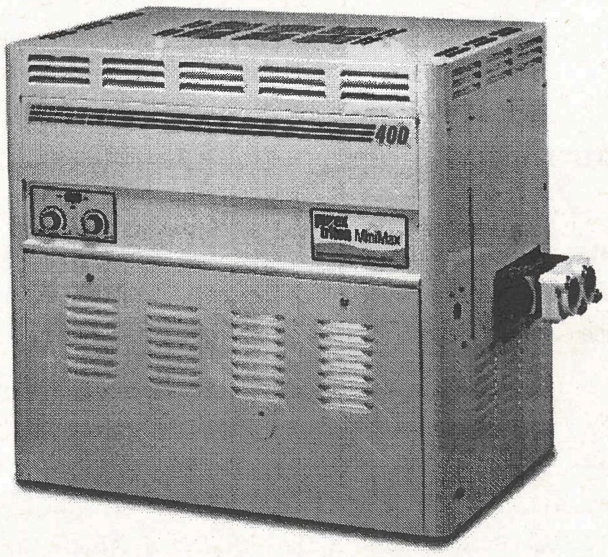

To Consumer Retain For Future Reference

U.S. Patent Numbers
5,318,007 - 5,228,618
5,201,307 - 4,595,825

⚠WARNING

Warning: Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or death. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

For Your Safety

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or other appliances.

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Introduction

MiniMax Plus and PowerMax*

Pool and Spa Heaters

Congratulations on your purchase of a MiniMax Plus high performance heating system. Proper installation and service of your new heating system and correct chemical maintenance of the water will ensure years of enjoyment. The MiniMax Plus is a compact, lightweight and efficient gas fired high performance pool and spa heater that can be directly connected to schedule 40 PVC pipe and has a built-in top. The MiniMax Plus, also comes equipped with PurexTriton's nine function indicator lights (electronic ignition only) which show, at a glance, the proper functioning of the heater. All **electronic ignition** MiniMax Plus heaters are designed with an intermittent ignition device (IID) which eliminates the need for a standing pilot. The **electronic ignition** MiniMax Plus requires is an external power source (120 VAC or 240 VAC) 50/60 Hz to operate. The **millivolt** MiniMax Plus has a self sustaining pilot and requires NO external power source.

All MiniMax and PowerMax pool and spa heaters are year 2000 compliant.

Unless noted otherwise, any references to the MiniMax Plus include the PowerMax (Induced Draft) models. The wiring and venting of the PowerMax is covered in an appendix to this manual.

IMPORTANT NOTICES

...For the installer and operator of the MiniMax Plus pool and spa heater. The manufacturer's warranty may be void if, for any reason, the heater is improperly installed and/or operated. Be sure to follow the instructions set forth in this manual. If you need any more information, or if you have any questions regarding to this pool heater, please contact PacFab, Inc. at (800) 831-7133.

These heaters are designed for the heating of swimming pools and spas, and should never be employed for use as space heating boilers, general purpose water heaters, in non-stationary installations, or for the heating of salt water.

Do not use the heater to protect pools or spas from freezing if the final maintenance temperature desired is below 60° F. as this will cause condensation related problems.

CODE REQUIREMENTS

The installation must conform with local codes or in the absence of local codes with the latest National Fuel Gas Code, ANSI Z223.1, and the latest edition of the National Electrical Code, NFPA 70.

Installation in Canada to be made in accordance with the latest CAN/CGA-B149.1 or .2 and CSA C22.1 Canadian Electric Code, part 1.

MEMBER Gama

DESIGN AMERICAN GAS ASSOCIATION CERTIFIED

APPROVED

This instruction manual provides operating instructions, installation and service information for the MiniMax Plus high performance heater. The information in this manual applies to the MiniMax Plus 150, 195, 200, 250, 300, 350, and 400 natural gas and propane (LP) models.

It is very important that the owner/installer read and understand the section covering installation instructions, and recognize the local and state codes before installing the MiniMax Plus. History and experience has shown that most heater damage is caused by improper installation practices.

WARRANTY INFORMATION

The MiniMax Plus pool heater is sold with a limited factory warranty. ***Specific details are described on the back cover of this manual and a copy of the warranty and warranty registration card are included with the product.*** Return the warranty registration card after filling in the serial number from the rating plate inside the heater.

PacFab's high standards of excellence include a policy of continuous product improvement resulting in your state-of-the-art heater. We reserve the right to make improvements which change the specifications of the heater without incurring an obligation to update the current heater equipment.

Operation

SAFETY RULES

1. Spa or hot tub water temperatures should never exceed 104° F (40° C). A temperature of 100° F (38° C) is considered safe for a healthy adult. Special caution is suggested for young children.
2. Drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness and subsequently result in drowning.
3. Pregnant women beware! Soaking in water above 102° F (39° C) can cause fetal damage during the first three months of pregnancy (resulting in the birth of a brain-damaged or deformed child). Pregnant women should stick to the 100° F (38° C) maximum rule.
4. Before entering the spa or hot tub, the user should check the water temperature with an accurate thermometer. Spa or hot tub thermostats may err in regulating water temperatures by as much as 4° F (2.2° C).
5. Persons with a medical history of heart disease, circulatory problems, diabetes or blood pressure problems should obtain their physician's advice before using spas or hot tubs.
6. Persons taking medication which induce drowsiness, such as tranquilizers, antihistamines or anticoagulants should not use spas or hot tubs.

⚠WARNING

Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the appliance. Do not use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and to replace any part of control system and gas control which has been under water.

MINIMAX PLUS ELECTRONIC IGNITION LIGHTING/OPERATION - NATURAL GAS

FOR YOUR SAFETY: READ BEFORE LIGHTING

⚠WARNING

If you do not follow these instructions exactly, a fire or explosion may result causing personal injury, loss of life and property damage.

Do not attempt to light the heater if you suspect a natural gas leak. Lighting the heater can result in a fire or explosion which can cause personal injury, death, and property damage.

A. This heater is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.

B. **BEFORE OPERATING** smell all around the heater area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any heater.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the Fire Department.

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it. Call a qualified service technician. Forced or attempted repair may result in a fire or explosion.

D. Do not use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and to replace any part of the control system and any gas control which has been under water.

E. The MiniMax Plus incorporates (9) nine indicator lights to aid you in the operation of the heater, and to assist in diagnosing a failure in the heater's function.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above.
2. Set the thermostat to the lowest setting.
3. Turn off electric power to the heater.
4. This heater is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
5. Remove the control access door.
6. Push in gas control knob slightly and turn clockwise ↷ to "OFF".
7. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "B" in the safety information above. If you don't smell gas, go to the next step.
8. Turn knob on gas control counterclockwise ↶ to "ON"; see Figure 1.
9. Replace the control access door.
10. Turn on the electrical power to the heater.
11. Set the thermostat to the desired setting.
12. If the heater will not operate, follow the instructions "To Turn Off Gas To Heater" and call your service technician or gas supplier.

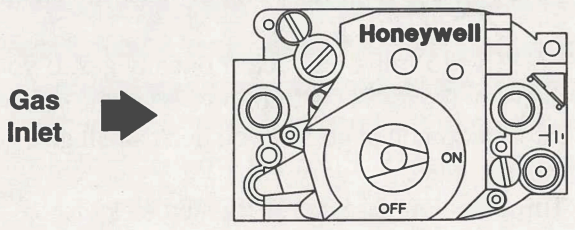


Figure 1. Gas control knob shown in "ON" position.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the heater if service is to be performed.
3. Remove control access door.
4. Push in gas control knob slightly and turn clockwise ↷ to "OFF". **Do not force.**
5. Replace control access door.

MINIMAX PLUS ELECTRONIC IGNITION LIGHTING/OPERATION - PROPANE

FOR YOUR SAFETY: READ BEFORE LIGHTING

NOTE

The MiniMax Plus propane models have special features for additional safety and protection. Read the safety instructions for natural gas (page 5) before proceeding.

⚠WARNING

If you do not follow these instructions exactly, a fire or explosion may result causing personal injury, loss of life and property damage.

Since propane gas is heavier than air, escaping propane will accumulate and remain at ground level. Do not attempt to light the heater. If you suspect a propane leak, lighting the heater can result in a fire or explosion which can cause personal injury, death, and property damage.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light matches or lighter.
- Do not try to light any heater.
- Do not touch any electrical switch; do not use any phone in your building.
- Shut off gas line at propane tank.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the Fire Department.
- Do not tamper with the heater because it is dangerous and voids all warranties.

Safety Lockout:

This MiniMax Plus Propane Heater is equipped with a 100% safety lockout feature. If the pilot does not light within a maximum of 90 seconds, lockout will occur.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above.
2. Set the thermostat to the lowest setting.
3. Turn off electric power to the heater.
4. This heater is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
5. Remove the control access door.
6. Push in gas control knob slightly and turn clockwise ↷ to "OFF".
7. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "B" in the safety information on page 5. If you don't smell gas, go to the next step.
8. Turn knob on gas control counterclockwise ↶ to "ON"; see Figure 2.
9. Replace the control access door.
10. Turn on the electrical power to the heater.
11. Set the thermostat to the desired setting.
12. If the heater will not operate, follow the instructions "To Turn Off Gas To Heater" and call your service technician or gas supplier.

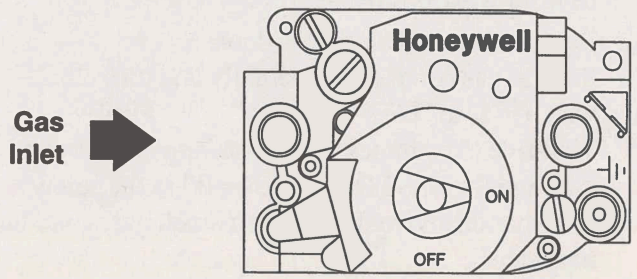


Figure 2. Gas control knob shown in "ON" position.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the heater if service is to be performed.
3. Remove control access door.
4. Push in gas control knob slightly and turn clockwise ↷ to "OFF". **Do not force.**
5. Replace control access door.

MINIMAX PLUS MILLIVOLT LIGHTING/OPERATION-NATURAL GAS & PROPANE

FOR YOUR SAFETY: READ BEFORE LIGHTING

⚠WARNING

If you do not follow these instructions exactly, a fire or explosion may result causing personal injury, loss of life and property damage.

Since propane gas is heavier than air, escaping propane will accumulate and remain at ground level. Do not attempt to light the heater. If you suspect a propane leak, lighting the heater can result in a fire or explosion which can cause personal injury, death, and property damage.

A. This heater is equipped with a pilot which must be lighted manually. When lighting the pilot, follow these instructions exactly.

B. **BEFORE LIGHTING** smell all around the heater area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

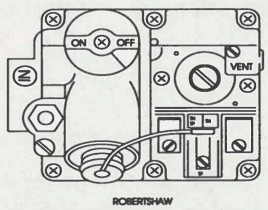
- Do not try to light any heater.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the Fire Department.

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it. Call a qualified service technician. Forced or attempted repair may result in a fire or explosion.

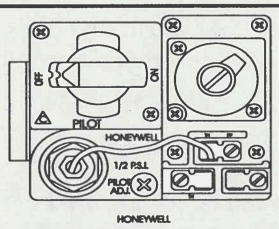
D. Do not use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and to replace any part of the control system and any gas control which has been under water.

LIGHTING INSTRUCTIONS

1. **STOP!** Read the safety information above.
2. Set the thermostat to the lowest setting.
3. Turn off electric power to the heater.
4. Push in gas control knob slightly and turn clockwise ↷ to "OFF".



Robertshaw Millivolt Gas Valve
Figure 3.



Honeywell Millivolt Gas Valve
Figure 4.

Gas control knobs shown in "OFF" position.

NOTE

Knob cannot be turned from "Pilot to "OFF"" unless knob is pushed in slightly. **DO NOT FORCE.**

5. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "B" in the safety information above. If you don't smell gas, go to the next step.
6. Push in gas control knob slightly and turn counterclockwise ↶ to "Pilot".
7. Push the control knob all the way and hold in. Immediately light the pilot with Presslite matchless ignition system by pressing the red igniter button (located at the panel next to the gas valve). Continue to hold the control knob in for about one (1) minute after the pilot is lit. Release knob and it will pop back up. Pilot should remain lit. If it goes out, repeat steps 4 through 7.
   - If knob does not pop up when released, stop and immediately call your service technician or gas supplier.
   - If the pilot will not stay lit after several tries, turn the gas control knob to "OFF" and call your service technician or gas supplier.
8. Turn knob on gas control counterclockwise ↶ to "ON".
9. Replace the control access door.
10. Set the thermostat to the desired setting.

Figure 5.

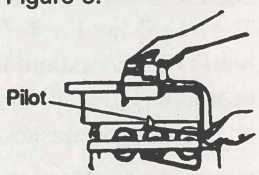
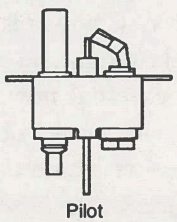


Figure 6.



TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the heater if service is to be performed.
3. Remove control access door.
4. Push in gas control knob slightly and turn clockwise ↷ to "OFF". **Do not force.**
5. Replace control access door.

OPERATING (CONTROLS)

Dual Temperature Control System - (Electronic and Millivolt Models)

For convenience and economy all MiniMax Plus heaters are equipped with two thermostats on the front of the heater control panel; see Figure 7.

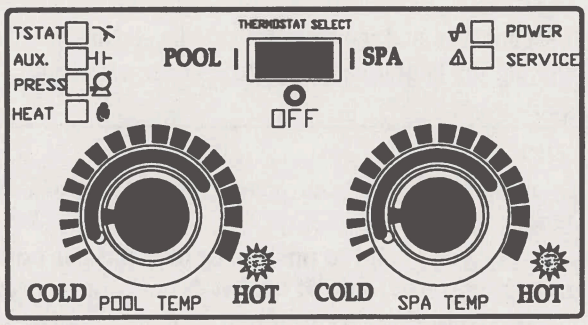


Figure 7.

THERMOSTAT KNOB STOPPER

Each thermostat is equipped with a mechanical stop that can be locked or unlocked with use of a screwdriver to prevent temperatures in excess of that desired by the user; see Figure 8.

The maximum setting can be adjusted by loosening the screw "A" and turning the stopper dial to desired maximum setting. Lock the setting by tightening the screw. The Mechanical stop is under the knob. Ensure that the knob is stopping at the correct position when the knob is rotated clockwise from a lower temperature position. (See Thermostat Adjustment.)

NOTE

To eliminate error due to piping heat losses, measure pool temperature with an accurate thermometer directly at the pool or spa.

THERMOSTAT ADJUSTMENT

The knob with locking feature eliminates the need for constant thermostat adjustments. Set the knob pointer to the desired pool or spa temperature.

If further adjustment is needed, rotate the knob until the desired temperature is obtained. This knob position corresponding to your desired maximum pool or spa temperature may now be preset (locked) by the knob stopper which prevents the knob from being turned beyond the maximum temperature you set.

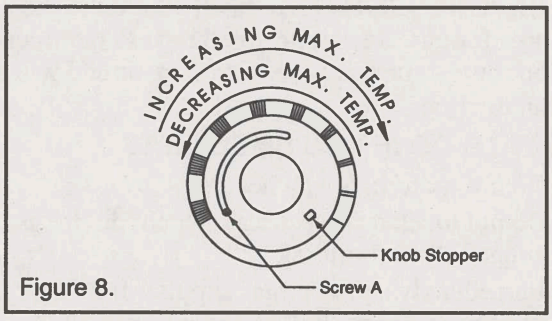


Figure 8.

POWER (THERMOSTAT SELECT) SWITCH

The Pool/Off/Spa switch allows the heater to be turned off when heating is not desired.

1. "Pool" position - Maintains selected pool temperature.
2. "Off" position - Heater will not come on regardless of drop in pool or spa temperature.
3. "Spa" position - This allows separate control of spa water temperature.

INDICATOR LIGHT DESCRIPTION

The MiniMax Pool Heater provides nine status indicator lights, six can be seen from the front of the control panel which help you understand the operation of the heater. If something should go wrong, the lights will aid in troubleshooting the problem. Three additional lights can be seen after opening the control panel. These three lights give the service technician advanced troubleshooting capability. All the LED lights are green with the exception of the red service LED.

POWER LIGHT (POWER)

The light is on at all times, in any switch position, indicating 24 VAC power is being supplied to the control circuit. If it fails to light, no other light will be on. Possible causes are: a) external power to the heater is disconnected, check service panel circuit breaker or fuses; b) local circuit breaker inside the transformer has tripped -- investigate cause before resetting; c) transformer has failed.

THERMOSTAT (TSTAT)

This light is on when the thermostat contacts close, signaled by the water temperature falling below the setpoint, calling for the heater to fire to maintain the desired water temperature.

AUXILIARY (AUX)

This light is on when it indicates the remote switch contacts are closed. This allows you to observe if your remote switch is properly closing the heater control circuit. When shipped from the factory a jumper is installed to maintain closed circuit in the absence of a remote switch.

PRESSURE (PRESS)

This light is on when Spa/Pool Selector switch is on, indicates the circulation pump is running properly. If pressure light fails to light, the pump may have lost its prime or water flow may be restricted by an inadvertently closed valve or clogged filter or pump basket. If you have determined that there is no water flow restriction to the heater, you should call a qualified serviceman.

HEAT (HEAT)

The heat light is on any time the thermostat has signaled a call for heat which initializes the ignition safety firing circuit -- the light comes on to indicate successful firing of the main burners.

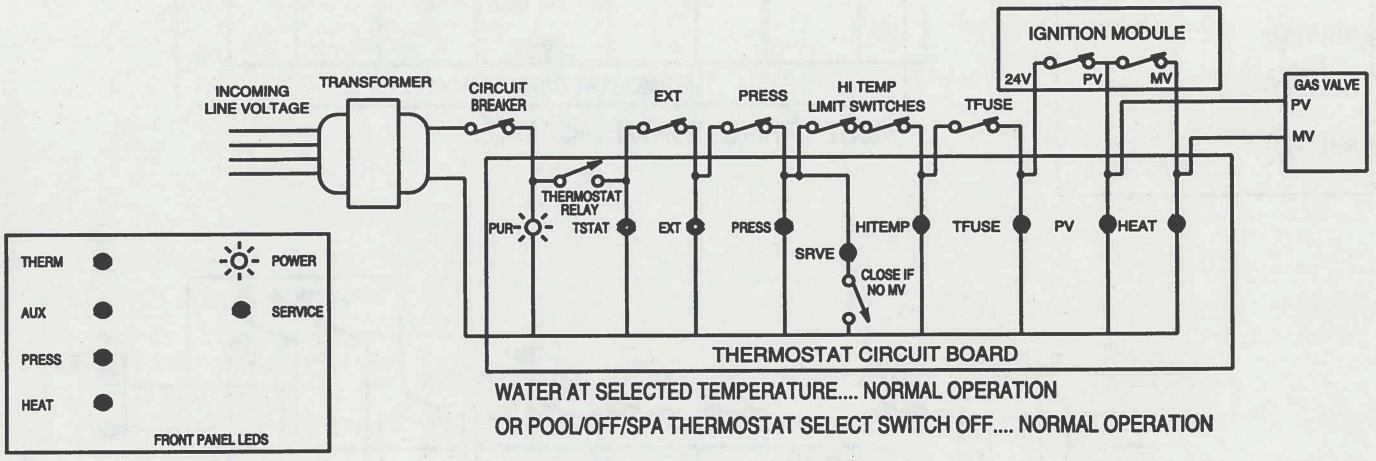
SERVICE (SERVICE)

The service light is off during normal operation of heater. The light only comes on if a problem with a control has occurred or when the heater is first firing. The problem must be investigated by the serviceman prior to attempts to fire the heater again.

The diagrams that follow give examples of troubleshooting a malfunctioning heater using the assistance of the indicator lights.

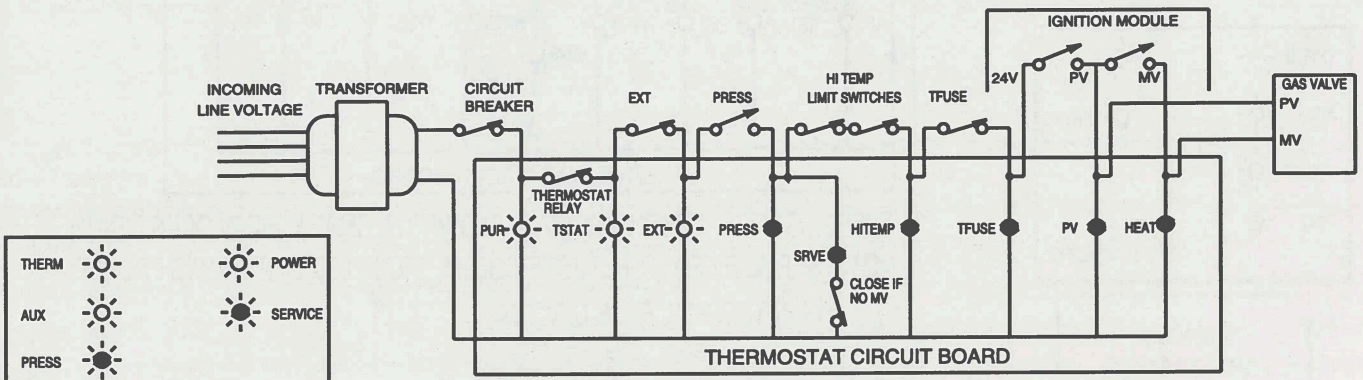
TROUBLESHOOTING (CONTROLS)

Example of troubleshooting with the assistance of the indicator lights.



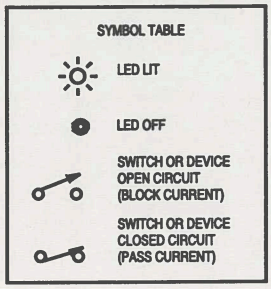
WATER AT SELECTED TEMPERATURE.... NORMAL OPERATION

OR POOL/OFF/SPA THERMOSTAT SELECT SWITCH OFF.... NORMAL OPERATION

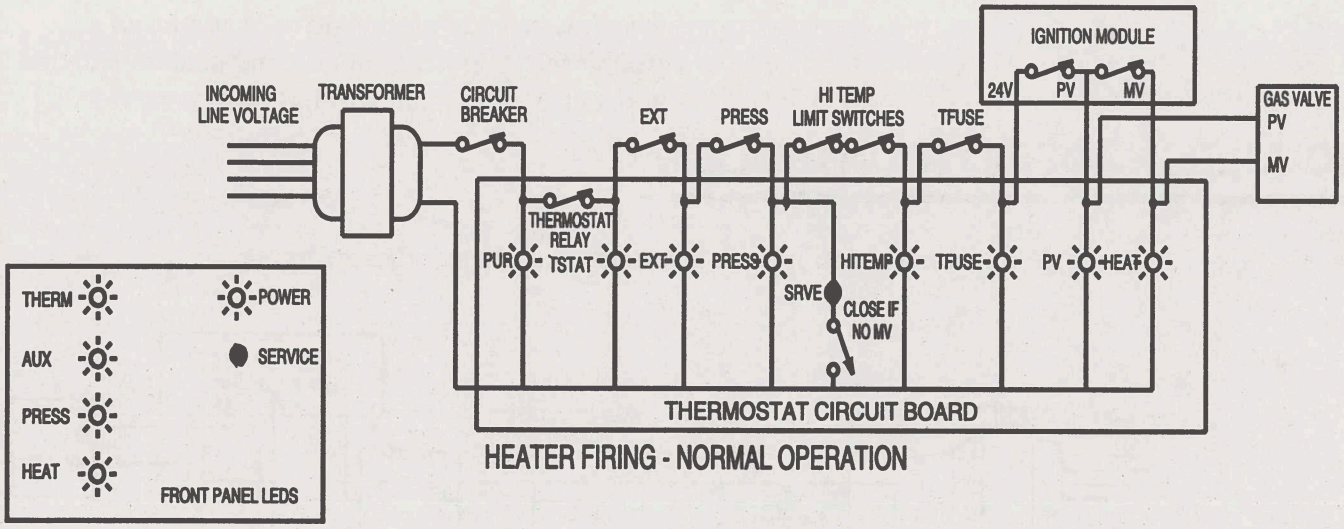


THERMOSTAT CALLING FOR HEAT - PUMP OFF (NO PRESSURE) BLOCKS FIRING

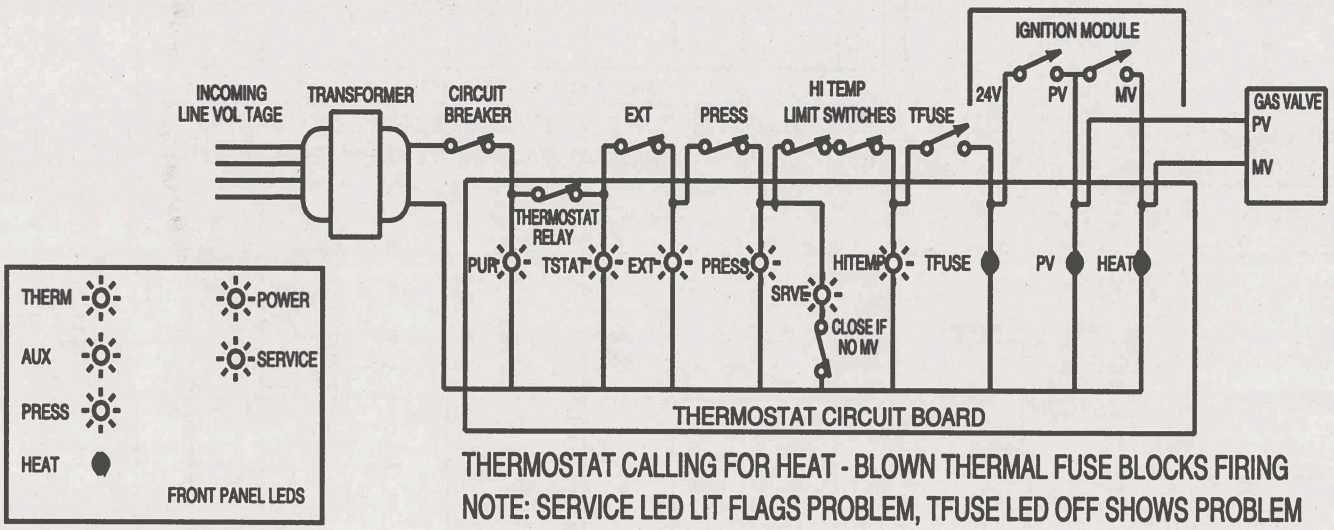
NORMAL OPERATION



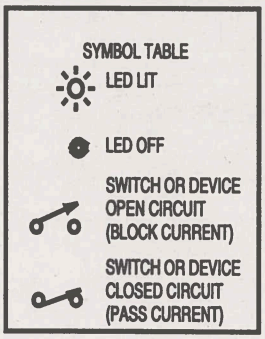
TROUBLESHOOTING (CONTROLS) - Continued



HEATER FIRING - NORMAL OPERATION



THERMOSTAT CALLING FOR HEAT - BLOWN THERMAL FUSE BLOCKS FIRING
NOTE: SERVICE LED LIT FLAGS PROBLEM, TFUSE LED OFF SHOWS PROBLEM IS IN THERMAL FUSE CIRCUIT



Maintenance

MAINTENANCE INSTRUCTIONS

It is recommended that you check the following items at least every six months and at the beginning of every swimming season.

1. Examine the venting system. Make sure there are no obstructions in the flow of combustion and ventilation air.
2. Visually inspect the main burner and the pilot burner flame. The normal color of the flame is blue. When flame appears yellow, burners should be inspected and cleaned; see Figure 10.

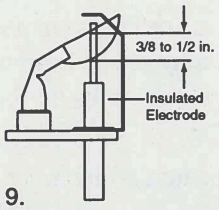


Figure 9.

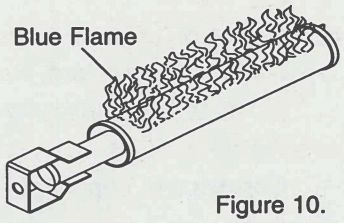


Figure 10.

3. Keep the heater area clear and free from combustibles and flammable liquids.

Relief Valve

In some installations, a relief valve is required on the MiniMax Plus. Test the relief valve at least once a year by lifting the valve lever. (A.S.M.E. version varies slightly and has the relief valve pre-installed at factory.)

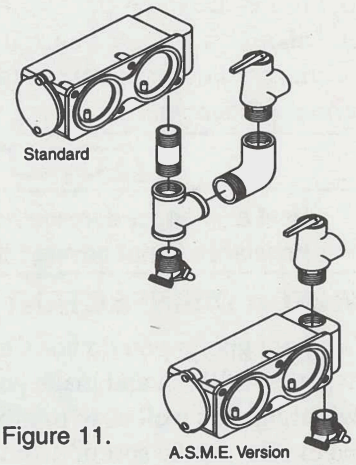


Figure 11.

ENERGY SAVING TIPS

1. If possible, keep pool or spa covered when not in use. This will not only cut heating costs, but also keep dirt and debris from settling in the pool and conserve chemicals.
2. Reduce the pool thermostat setting to 78° F. or lower. This is accepted as being the most healthy temperature for swimming by the American Red Cross.
3. Use an accurate thermometer.
4. When the proper maximum thermostat settings have been determined, tighten the thermostat knob stopper.
5. Set time clock to start circulation system no earlier than daybreak. The swimming pool loses less heat at this time.
6. For pools that are only used on the weekends, it is not necessary to leave the thermostat set at 78° F. Lower the temperature to a range that can be achieved easily in one day. Generally, this would be 10° F. to 15° F., if pool heater is sized properly.
7. During the winter or while on vacation, turn the heater off.
8. Set up a regular program of preventative maintenance for the heater each new swimming season. Check heat exchanger, controls, burners, operation, etc.

SPRING AND FALL OPERATION

If the pool is being used occasionally, do not turn the heater completely off. Set the thermostat down to 65° F. This will keep the pool and the surrounding ground warm enough to bring the pool up to a comfortable swimming temperature in a shorter period of time.

WINTER OPERATION

If the pool won't be used for a month or more, turn the heater off at the main gas valve. For areas where there is no danger of water freezing, water should circulate through the heater all year long, even though you are not heating your swimming pool. The MiniMax Plus should not be operated out doors at temperatures below 0° F. for propane and -20° F. for natural gas. Where freezing is possible, it is necessary to drain the water from the heater. This may be done by opening the drain valve located at the inlet/outlet header (see Figure 11.) allowing all water to drain out of the heater. It would be a good practice to use compressed air to blow the water out of the heat exchanger. ***(See additional notes under Important Notices in Introduction on page 3.)***

CHEMICAL BALANCE

POOL AND SPA WATER

Your PacFab pool heater was designed specifically for your spa or pool and will give you many years of trouble free service provided you keep your water chemistry in proper condition.

Three major items that can cause problems with your pool heater are improper pH, disinfectant residual, and total alkalinity. These items, if not kept properly balanced, can shorten the life of the heater and cause permanent damage.

⚠CAUTION

Heat exchanger damage resulting from chemical imbalance is not covered by the warranty.

WHAT A DISINFECTANT DOES

Two pool guests you do not want are algae and bacteria. To get rid of them and make pool water sanitary for swimming - as well as to improve the water's taste, odor and clarity - some sort of disinfectant must be used.

Chlorine and bromine are universally approved by health authorities and are accepted disinfecting agents for bacteria control.

WHAT IS A DISINFECTANT RESIDUAL?

When you add chlorine or bromine to the pool water, a portion of the disinfectant will be consumed in the process of destroying bacteria, algae and other oxidizable materials. The disinfectant remaining is called chlorine residual or bromine residual. You can determine the disinfectant residual of your pool water with a reliable test kit, available from your local pool supply store.

You must maintain a disinfectant residual level adequate enough to assure a continuous kill of bacteria or virus introduced into pool water by swimmers, through the air, from dust, rain or other sources.

It is wise to test pool water regularly. Never allow chlorine residual to drop below 0.6 ppm (parts per million). The minimum level for effective chlorine or bromine residual is 1.4 ppm.

pH - The term pH refers to the acid/alkaline balance of water expressed on a numerical scale from 0 to 14. A test kit for measuring pH balance of your pool water is available from your local pool supply store; see Table 1.

Table 1. **pH Chart**

Strongly Acid						Neutral					Strongly Alkaline			
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Muriatic Acid has a pH of about 0. Pure water is 7 (neutral). Weak Lye solution have a pH of 13-14.

RULE: 7.4 to 7.6 is a desirable pH range. It is essential to maintain correct pH, see Table 2.

If pH becomes too high (over alkaline), it has these effects:

1. Greatly lowers the ability of chlorine to destroy bacteria and algae.
2. Water becomes cloudy.
3. There is more danger of scale formation on the plaster or in the heat exchanger.
4. Filter elements may become blocked.

If pH is too low (over acid) the following conditions may occur:

1. Excessive eye burn or skin irritation.
2. Etching of the plaster.
3. Corrosion of metal fixtures in the filtration and recirculation system, which may create brown, blue, green, or sometimes almost black stains on the plaster.
4. Corrosion of copper in the heater, which may cause leaks.
5. If you have a sand and gravel filter, the alum used as a filter aid may dissolve and pass through the filter.

CAUTION: Do not test for pH when the chlorine residual is 3.0 ppm or higher, or bromine residual is 6.0 ppm or higher. See your local pool supply store for help in properly balancing your water chemistry.

RULE: Chemicals that are acid lower pH. Chemicals that are alkaline raise pH.

Table 2. **pH Control Chart**

6.8 7.0	7.2	7.4 7.6	7.8	8.0 8.2 8.4
Add Soda, Ash or Sodium Bicarbonate	Marginal	Ideal	Marginal	Add Acid

ALKALINITY High - Low:

"Total alkalinity" is a measurement of the total amount of alkaline chemicals in the water, and control pH to a great degree. (It is not the same as pH which refers merely to the relative alkalinity/acidity balance.) Your pool water's total alkalinity should be 100 - 140 ppm to permit easier pH control.

A total alkalinity test is simple to perform with a reliable test kit. You will need to test about once a week and make proper adjustments until alkalinity is in the proper range. Then, test only once every month or so to be sure it is being maintained. See your local pool dealer for help in properly balancing the water chemistry.

Installation Instructions

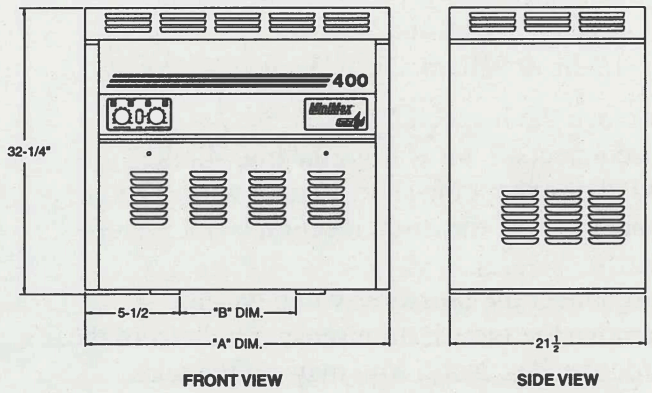
SPECIFICATIONS

IMPORTANT NOTICE: These installation instructions are designed for use by qualified personnel only, trained especially for installation of this type of heating equipment and related components. Some states require installation and repair by licensed personnel. If this applies in your state, be sure your contractor bears the appropriate license.

Outdoor installation - stackless

Model	"A" Dim	"B" Dim
150	17 7/8 in.	6½ in.
195/200	20 7/8 in.	9½ in.
250	23 7/8 in.	12½ in.
300	26 7/8 in.	15½ in.
350	29 7/8 in.	18½ in.
400	33 3/8 in.	22 3/8 in.

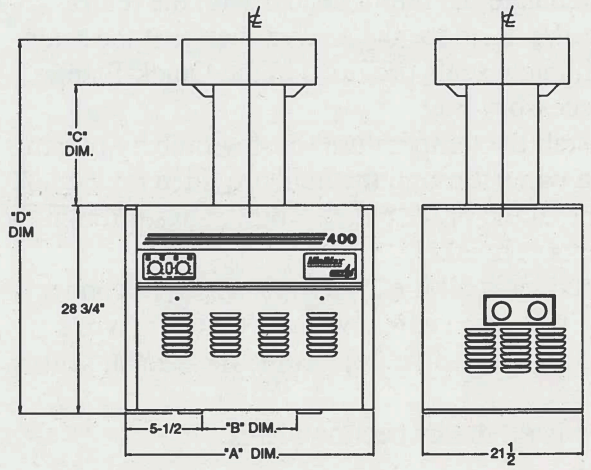
Table 3.



Outdoor installation - with vent kit

Model	"A" Dim	"B" Dim	"C" Dim	"D" Dim
150	17 7/8 in.	6½ in.	7¾ in.	39¾ in.
195/200	20 7/8 in.	9½ in.	10 in.	42¾ in.
250	23 7/8 in.	12½ in.	10 in.	42¾ in.
300	26 7/8 in.	15½ in.	10¼ in.	43¾ in.
350	29 7/8 in.	18½ in.	13 in.	47¾ in.
400	33 3/8 in.	22 3/8 in.	17 in.	51¾ in.

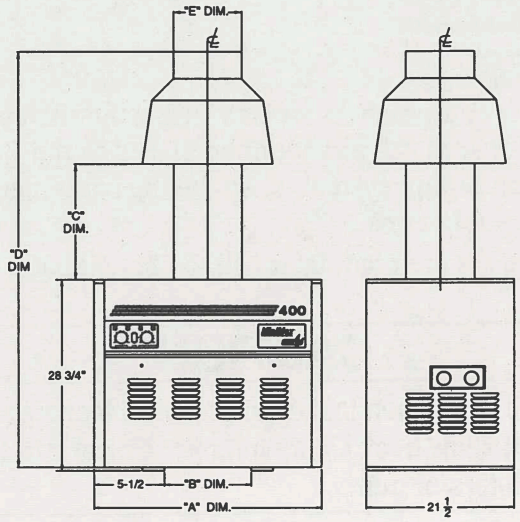
Table 4.



Indoor installation - stack (USA only)
Outdoor shelter installation (Canada)

Model	"A" Dim	"B" Dim	"C" Dim	"D" Dim	"E" Dim
150	17 7/8 in.	6½ in.	13 in.	52¾ in.	6 in.
195/200	20 7/8 in.	7½ in.	13 in.	53 7/8 in.	7 in.
250	23 7/8 in.	7½ in.	13 in.	53 7/8 in.	7 in.
300	26 7/8 in.	8½ in.	13 in.	55 in.	8 in.
350	29 7/8 in.	9½ in.	13 in.	56 in.	9 in.
400	33 3/8 in.	10½ in.	17 in.	60¾ in.	10 in.

Table 5.



WATER CONNECTIONS

Reversible Inlet/Outlet Connection

The MiniMax Plus heater is factory assembled with right side inlet/outlet water connections. The inlet/outlet header can be reversed for left side water connections without removing the heat exchanger.

Reversing Water Connections

Disassembly

Tools needed:

1/4 in Nut Driver
9/16 in. Socket and Wrench
1/2 in. & 9/16 in. Open Wrench

1. Remove the inspection plates.
2. Disconnect all wires from the high-limit switches except the short jumper wire. The exact order of the disconnection is not important.
3. Disconnect the pressure switch wiring.
4. Remove the temperature sensing bulb from the in/out header. **Note:** You may cut the wire bundle ties.
5. Exchange the in/out header with the return header. Replace the heat exchanger tube seals with new seals provided in the Quick-Flange Accessory Bag.
6. Install the temperature sensing bulb by passing the wires through the hole provided on the left side of the brace panel. Route wires through the support bracket.
7. Reconnect all the high limit wires. Reconnect the pressure switch wiring. Route the wires through the same hole as the thermostat sensor wires.
8. Reinstall the inspection plates.

PLUMBING

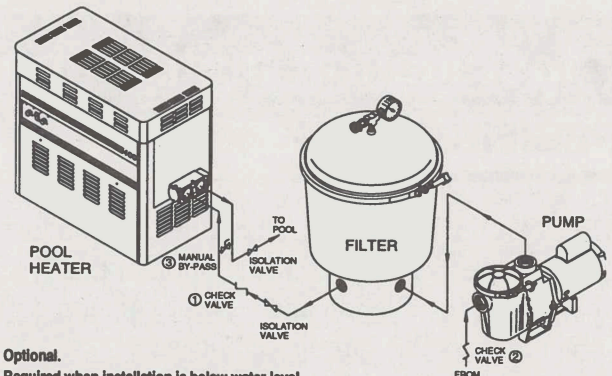
VALVES

When any equipment is located below the surface of the pool or spa, valves should be placed in the circulation piping system to isolate the equipment from the pool or spa.

Check valves are recommended to prevent back siphon.

⚠CAUTION

Exercise care when installing chemical feeders so as to not allow back siphoning of chemical into the heater, filters or pump.



① Optional.
② Required when installation is below water level.
③ Required when flow rates exceed 120 gpm.

Figure 12.

PLUMBING CONNECTIONS

The MiniMax Plus heater has the unique capability of direct schedule 40 PVC plumbing connections. A Quick-Flange has been included with the MiniMax Plus to insure conformity with PurexTriton's recommended PVC plumbing procedure. Other plumbing connections can be used. The instructions on page 13 show methods for successfully connecting plumbing to the inlet/outlet header, with the Quick-Flange.

⚠CAUTION

Before operating the heater on a new installation, turn on the circulation pump and bleed all the air from the filter using the air relief valve on top of the filter. Water should flow freely through the heater.

Do not operate the heater unless water in the pool/spa is at the proper level.

MANUAL BY-PASS

Where the flow rate exceeds the maximum 120 GPM, a manual bypass should be installed and adjusted. After adjustments are made, the valve handle should be removed to avoid tampering.

Model	Min.	Max. *
150	20	120
195/200	20	120
250	30	120
300	30	120
350	40	120
400	40	120

* Do not exceed the maximum recommended flow rate for the connecting piping.

Table 6.

BELOW POOL INSTALLATION

If the heater is below water level, the pressure switch must be adjusted. This adjustment must be done by a qualified service technician.

WATER CONNECTIONS

QUICK-FLANGE INSTALLATION INSTRUCTIONS

Each MiniMax Plus Quick-Flange Accessory Kit contains the following items:

- **One (1) Quick-Flange unit**
- **Four (4) 3/8 Bolts**
- **Two (2) Plastic sleeves**
- **Two (2) 2 in. Rubber gaskets**
- **Four (4) 3/8 in. Washers**

FOR 1½ & 2 in. SCHEDULE 40 PVC PIPE

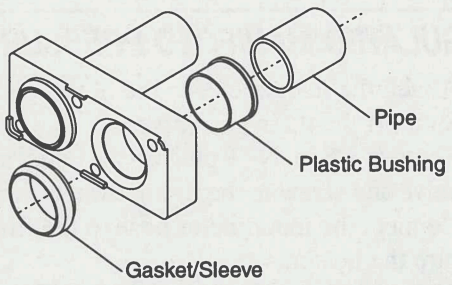


Figure 13.

1. Insert plastic sleeves into the "Quick-Flange" inlet/outlet openings.
2. Slip the 2 in. rubber gaskets over the plastic sleeves.
3. Bolt the "Quick-Flange" to the header.

NOTE

Tighten the bolts evenly! Do not over tighten!

4. Use plumbers roll or medium grit sand paper and clean the inlet/outlet openings of the "Quick-Flange". Use the same method to clean the 2 in. PVC pipe. The sand paper will break up any grease or contaminant that may not be cleaned away with a primer.
5. Use 711 PVC glue (or equivalent) and follow the manufacturer's recommendations. Apply to the inlet opening of the "Quick-Flange". Do the same to the PVC pipe and quickly insert the pipe into the "Quick-Flange" and twist the pipe a 1/4 turn. Do the same to the other opening of the "Quick-Flange".
6. For 1½ in. PVC pipe installations, first glue a 1½ in. X 2 in. sch 40 PVC bushing (not supplied or shown) to the end of the pipe prior to gluing to the "Quick-Flange".

FOR 1½ & 2 in. COPPER PIPE

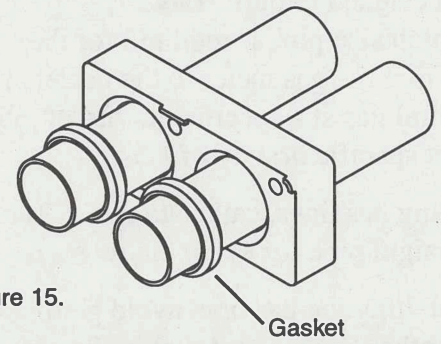


Figure 15.

NOTE

You **"DO NOT"** need the plastic bushings.*

1. Insert pipe into the inlet/outlet openings of the "Quick-Flange"
2. Slip the rubber gaskets over the pipe, using the supplied 2 in. rubber gasket for 2 in. copper pipe or the 1½ in. rubber gasket (not supplied, available from the factory) for the 1½ in. copper pipe.
3. Bolt the "Quick-Flange" to the header.

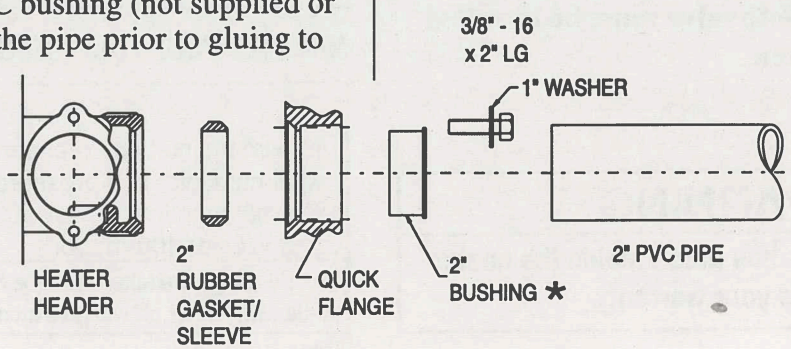


Figure 14.

GAS CONNECTIONS

GAS LINE INSTALLATIONS

Before installing the gas line, be sure to check which gas the heater has been designed to burn. This is important because different types of gas require different gas pipe sizes. The rating plate on the heater will indicate which gas the heater is designed to burn. Table 7, shows which size pipe is required for the distance from the gas meter to the heater. The table is for natural gas at a specific gravity of .65 and propane at specific gravity of 1.5.

When sizing gas lines, calculate three (3) additional feet of straight pipe for every elbow used.

When installing the gas line, avoid getting dirt, grease or other foreign material in the pipe as this may cause damage to the gas valve, which may result in heater failure.

The gas meter should be checked to make sure that it will supply enough gas to the heater and any other appliances that may be used on the same meter.

The gas line from the meter will usually be of a larger size than the gas valve supplied with the heater. Therefore a reduction of the connecting gas pipe will be necessary. Make this reduction as close to the heater as possible.

The heater and any other gas appliances must be disconnected from the gas supply piping system during any pressure testing on that system, (greater that ½ PSIG).

The heater and its gas connection must be leak tested before placing the heater in operation. **Do not use flame to test the gas line.** Use soapy water or another nonflammable method.

A manual main shut-off valve must be installed externally to the heater.

⚠WARNING

Do not install the gas line union inside the heater cabinet. This will void your warranty.

Pipe Sized For Length Of Run In Equivalent Feet Table 7.

	1/2 in.		3/4 in.		1 in.		1¼ in.		1½in.		2 in.	
Model	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP
150	10'	40'	50'	150'	150'	600'	-	-	-	-	-	-
195/200	-	20'	30'	80'	125'	250'	450'	600'	-	-	-	-
250	-	10'	20'	50'	70'	150'	250'	500'	600'	-	-	-
300	-	-	10'	30'	50'	100'	200'	350'	400'	600'	-	-
350	-	-	10'	20'	30'	70'	125'	250'	250'	500'	500'	-
400	-	-	-	10'	20'	60'	100'	150'	200'	450'	400'	-

REGULATED MANIFOLD PRESSURE TEST

1. Attach the manometer to the heater jacket.
2. Shut off the main gas valve.
3. Remove 1/8 in. NPT plug on the outlet side of the valve and screw in the fitting from the manometer kit.
4. Connect the manometer hose to the fitting.
5. Fire the heater.
6. The manometer must read 4 in. WC for natural gas, 11 in. WC for propane gas, **while** the heater is operating.
7. For adjustment, remove the Regulator Adjustment Cap and using a screwdriver turn the screw clockwise to increase - counterclockwise to decrease gas pressure.

Figure 16.

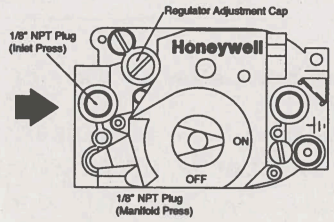
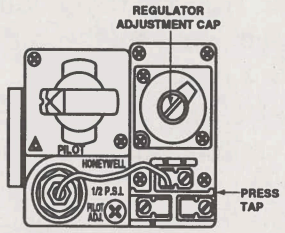


Figure 17.



⚠CAUTION

The use of Flexible Connectors (FLEX) is NOT recommended as they cause high gas pressure drops.

MINIMAX PLUS GAS PRESSURE REQUIREMENTS*

	Natural	Propane
Maximum inlet gas pressure	10 in. WC	14 in. WC
Minimum inlet gas pressure	**5 in. WC	12 in. WC
Normal manifold pressure	4 in. WC	11 in. WC
** 6 WC for 400 model		

***All Readings are taken with the heater fired. Any adjustments made with heater off will give incorrect readings.**

Table 8.

VENTILATION

OUTDOOR INSTALLATION ONLY

(See additional instructions for outdoor Power-Max units in PowerMax Appendix)

For outdoor installation with built in vent top, the heater must be placed in a suitable area on a level, noncombustible surface. Do not install the heater under an overhang with clearances less than 3 feet from the top of the heater. The area under an overhang must be open on three sides.

IMPORTANT!

In an outdoor installation it is important to protect your heater from water damage. Ensure water is diverted from overhanging eves with a proper gutter/ drainage system. The heater must be set on a level foundation for proper rain drainage.

Maintain minimum clearances as indicated below. Install a minimum of 5 feet below, and 4 feet horizontally from any opening to a building.

The heater should not be installed closer than 6 inches to any fences, walls or shrubs at any side or back, nor closer than 18 inches at the plumbing side. A minimum clearance of 24 inches must be maintained at the front of the heater.

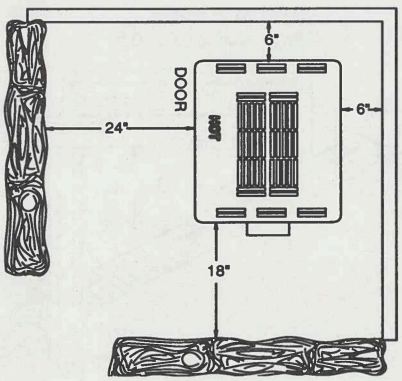


Figure 18.

IMPORTANT!

When locating the heater, consider that high winds can roll over or deflect off adjacent buildings and walls. Normally, placing the heater at least three feet from any wall will minimize downdraft.

Unusually high prevailing wind conditions and downdrafts may require the use of a stack type outdoor vent kit (available at additional cost).

NOTE

This unit shall not be operated outdoors at temperatures below 0° F. for propane and -20° F. for natural gas.

STACK TYPE OUTDOOR VENT KIT

Model	Vent Cap	Product No.	Vent Dia.
150	OV15	460237	6 in.
195/200	OV20	460222	7 in.
250	OV25	460223	7 in.
300	OV30	460224	8 in.
350	OV35	460225	9 in.
400	OV40	460226	10 in.

Table 9.

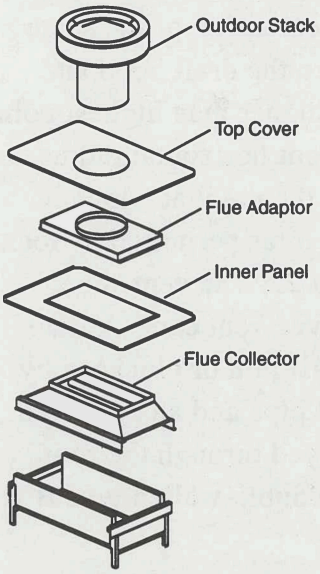


Figure 19.

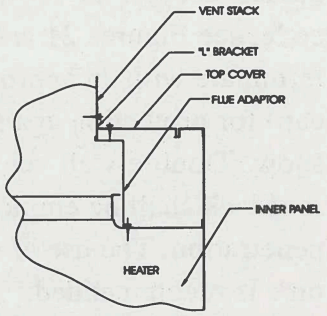


Figure 20.

OUTDOOR VENT CAP INSTALLATION

The MiniMax Plus heater is shipped standard as an outdoor stackless unit. To install the outdoor vent kit:

1. Take out the louvered outer top after first removing all 1/4 in. sheet metal screws attaching it along its perimeter to the cabinet. Set it aside.
2. Place the flue adaptor over the flue collector opening. Temporarily, put the top cover, from the kit, on with the label to the front of the heater. Center the flue adaptor evenly inside the top cover flue stack opening. Remove the top cover and secure the centered flue adaptor to the inner panel with the provided #8 x 1/2 in. drill qwik screws.
3. Place the top cover, with the hole for the stack, on the heater cabinet.
4. Install the vent stack through the hole in the top cover, over the flue adaptor top ring.
5. Using a 3/32 in. drill bit, position the "L" bracket to hold the top cover and outdoor stack. Drill the pilot holes through the "L" bracket holes to accept the screws.
6. Secure the vent stack and the inner top with the #8 x 1/4 in. sheet metal screws through the "L" brackets.

INDOOR INSTALLATION (USA ONLY)
OUTDOOR SHELTER INSTALLATION (CANADA)

(See additional instructions for outdoor PowerMax units in PowerMax Appendix)

All products of combustion and vent gases must be completely removed to the outside atmosphere through a vent pipe which is connected to the draft hood. A vent pipe extension of the same size must be connected to the draft hood and extended at least 2 feet higher than highest point of the roof within a 10 foot horizontal radius, and at least 3 ft. higher than the point at which it passes through the roof, or as permitted by local code; see Figures 21 and 22. The vent should terminate with an approved vent cap (weather cap) for protection against rain or blockage by snow. Double-wall vent pipe and an approved roof jack shall be employed through the roof penetration. The use of double-walled type B vent pipe is recommended.

The draft hood must be installed so as to be in the same atmospheric pressure zone as the combustion air inlet to the pool heater. The certified (factory) draft hood **must not** be modified in any way and must be employed in every indoor installation (with the exception of the PowerMax units).

The heater must be located as close as practical to a chimney or gas vent. The heater should be installed at least 5 feet away from the pool or spa.

The heater must be placed in a suitable room on a non-combustible floor or on a non-combustible base and in an area where leakage from heat exchanger or water connections will not result in damage to the are adjacent to the heater or the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan with adequate drainage, be installed under the heater. The pan must not restrict air flow.

Installations in basements, garages, or underground structures where flammable liquids may be stored must have the heater elevated 18 inches from the floor using a non-combustible base. The following minimum clearances from combustible materials must be provided.

	Side	Front	Back	Top
Water Connection	18 in.	24 in.		
Remaining	6 in.		6 in.	
Ceiling Clearance				36 in.*

*To ceiling or roof.

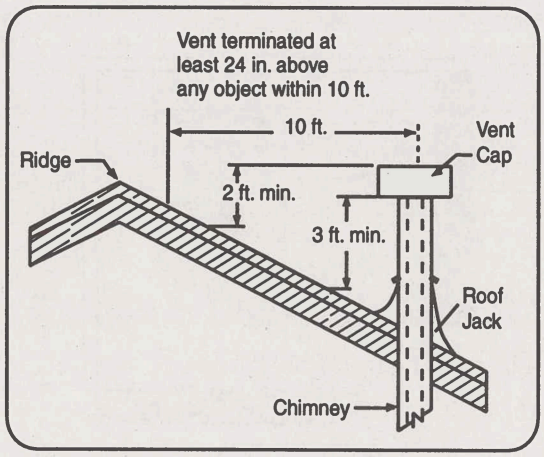


Figure 21.

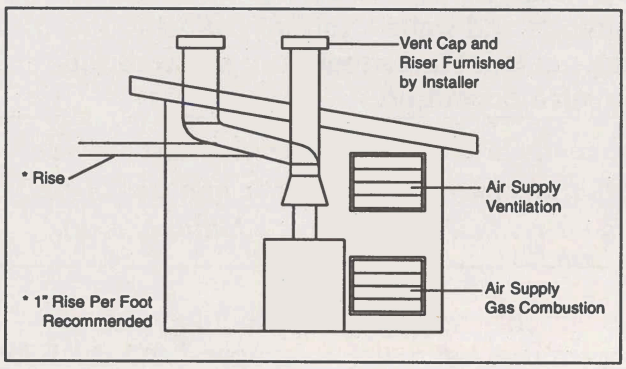

Vent Cap and Riser Furnished by Installer
* Rise
Air Supply Ventilation
Air Supply Gas Combustion
* 1" Rise Per Foot Recommended

Figure 22.

NOTE

The heater requires **two uninterrupted air supply openings;** one for ventilation and one to supply oxygen for proper gas combustion. The air supply openings should be sized according to Tables 10. and 11.

Air supply requirements below apply to all MiniMax heaters, including PowerMax versions.

	All Air From Inside	
Model	Air for Combustion Sq. In.	Air Ventilation Sq. In.
150	150	150
195/200	200	200
250	250	250
300	300	300
350	350	350
400	400	400

Table 10.

	All Air From Outside	
Model	Air for Combustion Sq. In.	Air Ventilation Sq. In.
150	37	37
195/200	50	50
250	63	63
300	77	77
350	90	90
400	100	100

Table 11.

INSTALLATION ON FLOORS CONSTRUCTED OF COMBUSTIBLE MATERIALS

The heater may be placed on a "combustible floor" using either of the two methods listed below:

a) Use Listed Factory Non-combustible Base Kit for use on combustible floors.

Model	Non-Combustible Base Kit
150	471389
195/200	471390
250	471391
300	471392
350	471393
400	471394

Table 12.

b) Construct a non-combustible base from masonry blocks as illustrated, see Figure 23.

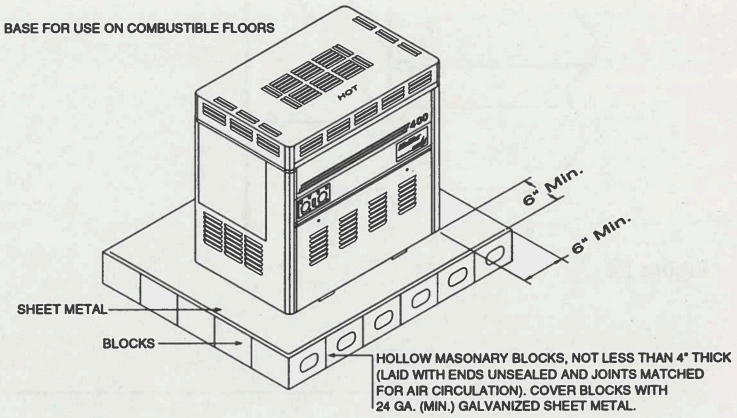

BASE FOR USE ON COMBUSTIBLE FLOORS
HOT
6" Min.
6" Min.
SHEET METAL
BLOCKS
HOLLOW MASONARY BLOCKS, NOT LESS THAN 4" THICK (LAID WITH ENDS UNSEALED AND JOINTS MATCHED FOR AIR CIRCULATION). COVER BLOCKS WITH 24 GA. (MIN.) GALVANIZED SHEET METAL.

Figure 23.

⚠CAUTION

Chemicals should not be stored near the heater installation. Combustion air can be contaminated by corrosive chemical fumes which can void the warranty.

STACK TYPE INDOOR DRAFT HOOD KIT

The proper draft hood and adapter must be installed on the heater as shown below and on page 20:

Model	Draft Hood	Product No.	Vent Dia.
150	DH15	460227	6 in.
195/200	DH20	460228	7 in.
250	DH25	460230	7 in.
300	DH30	460231	8 in.
350	DH35	460233	9 in.
400	DH40	460234	10 in.

Table 13.

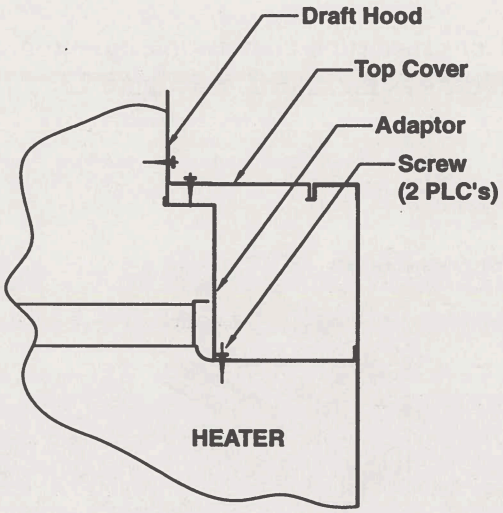


Figure 24.

INDOOR DRAFT HOOD INSTALLATION

1. Take out the louvered outer top piece after first removing the sheet metal screws, attaching it to the cabinet.
2. Install the adaptor (vent kit).
3. Install the top cover (vent kit).
4. Install the draft hood (vent kit).

Use the provided screws to secure the vent assembly.

ELECTRICAL, IID ELECTRONIC UNITS

Electrical Rating

60 Hz	115 V.A.C. or 230 V.A.C.
50/60 Hz	208 V.A.C. or 240 V.A.C.

NOTE

If any of the original wiring supplied with this heater must be replaced, installer must supply (No. 18 AWG 105° C. U.L. approved AWM low energy stranded) copper wire or it's equivalent.

In Canada: wires must be CSA approved.

⚠WARNING

The heater must be electrically grounded and bonded in accordance with local codes or, in the absence of local codes, with the latest national electrical codes ANSI/NFPA No. 70.

In Canada: CSA standard C22.1 Canada Electrical Code Part 1 and/or local codes.

Always use crimp type connectors when connecting two wires.

This heater is equipped with a reversible junction box to allow line voltage to be wired from either side.

Transformer Wiring Instruction

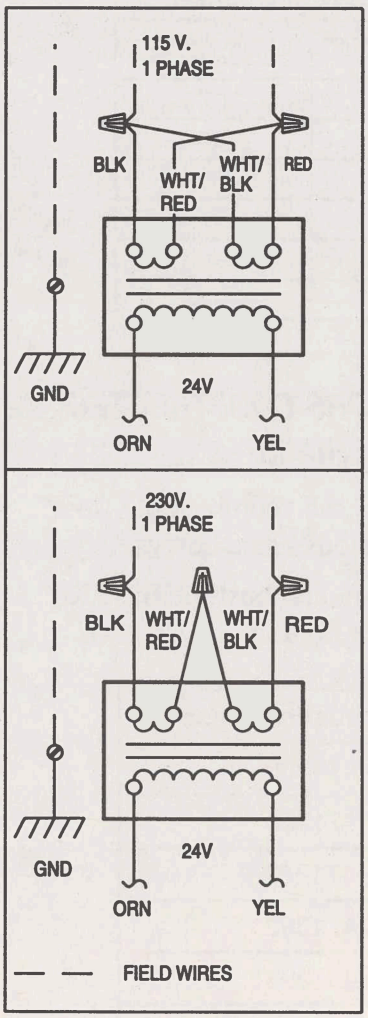


Figure 25.

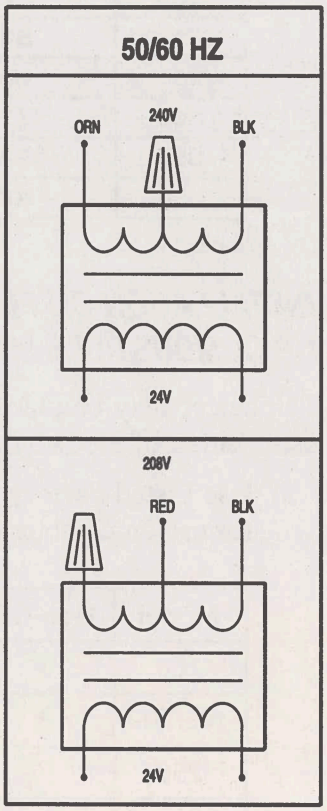
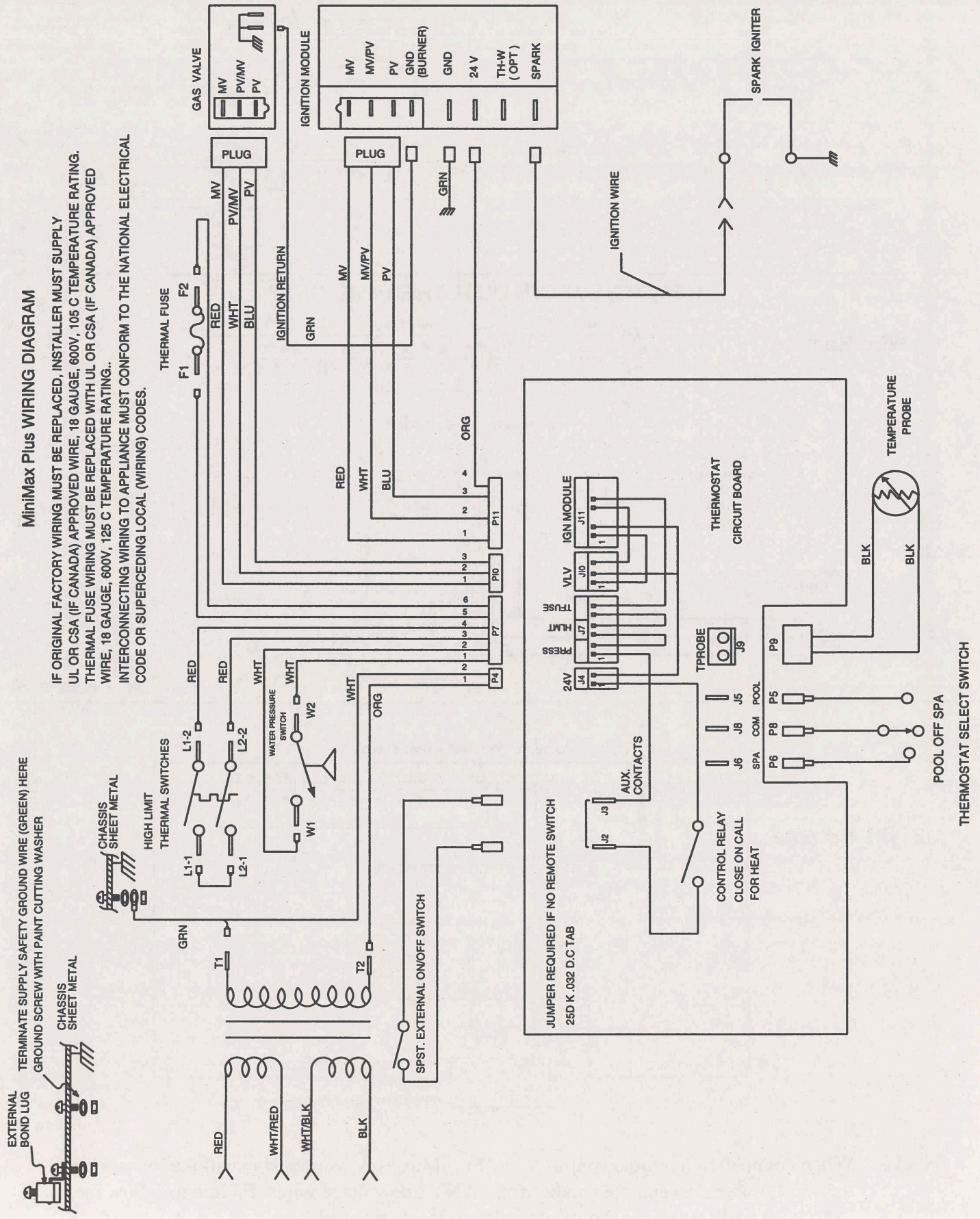


Figure 26.

MiniMax Plus Electronic Ignition Wiring Diagram



MiniMax Plus Millivolt Wiring Diagram

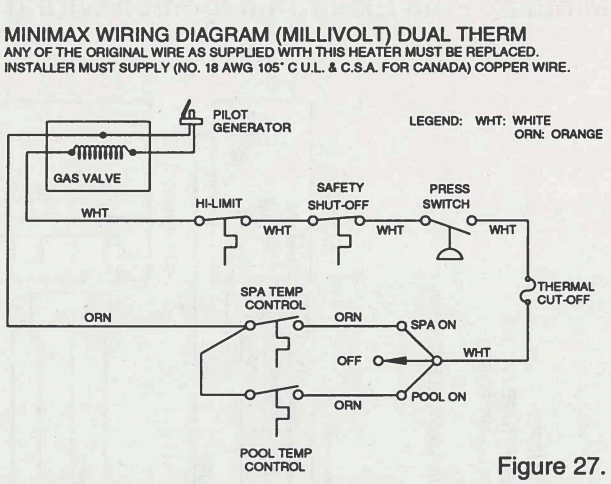


Figure 27.

REMOTE SWITCH DUAL THERM IID ONLY

3 Wire Remote

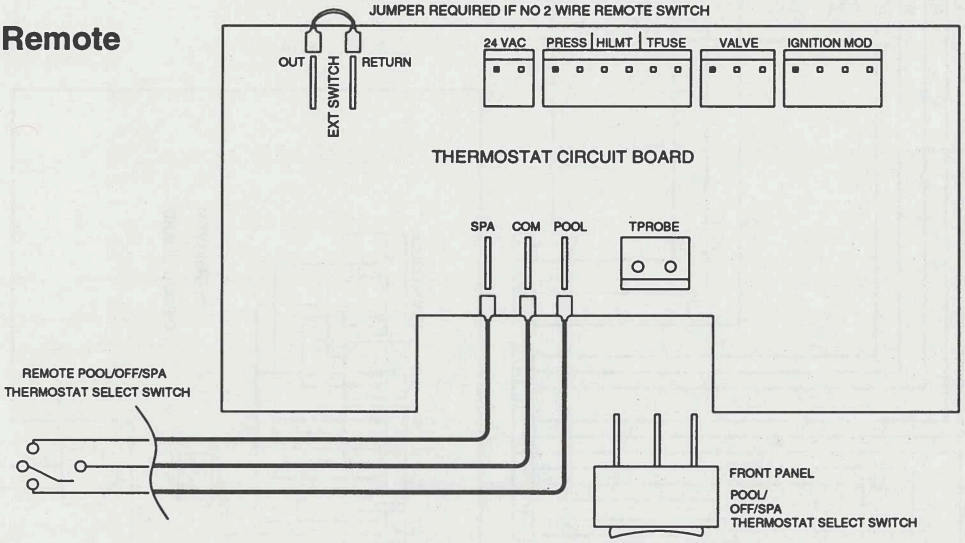


Figure 28.

2 Wire Remote

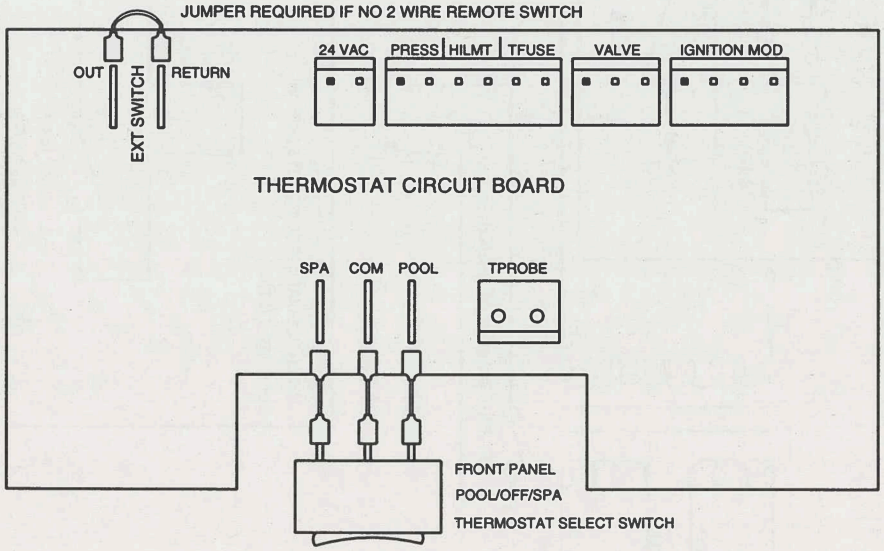


Figure 29.

NOTE: When connecting a remote control to the MiniMax Plus, you must install the low voltage thermostat wires in separate conduit from **ANY** line voltage wires. Failure to follow these instructions will cause the thermostat relay to react erratically.

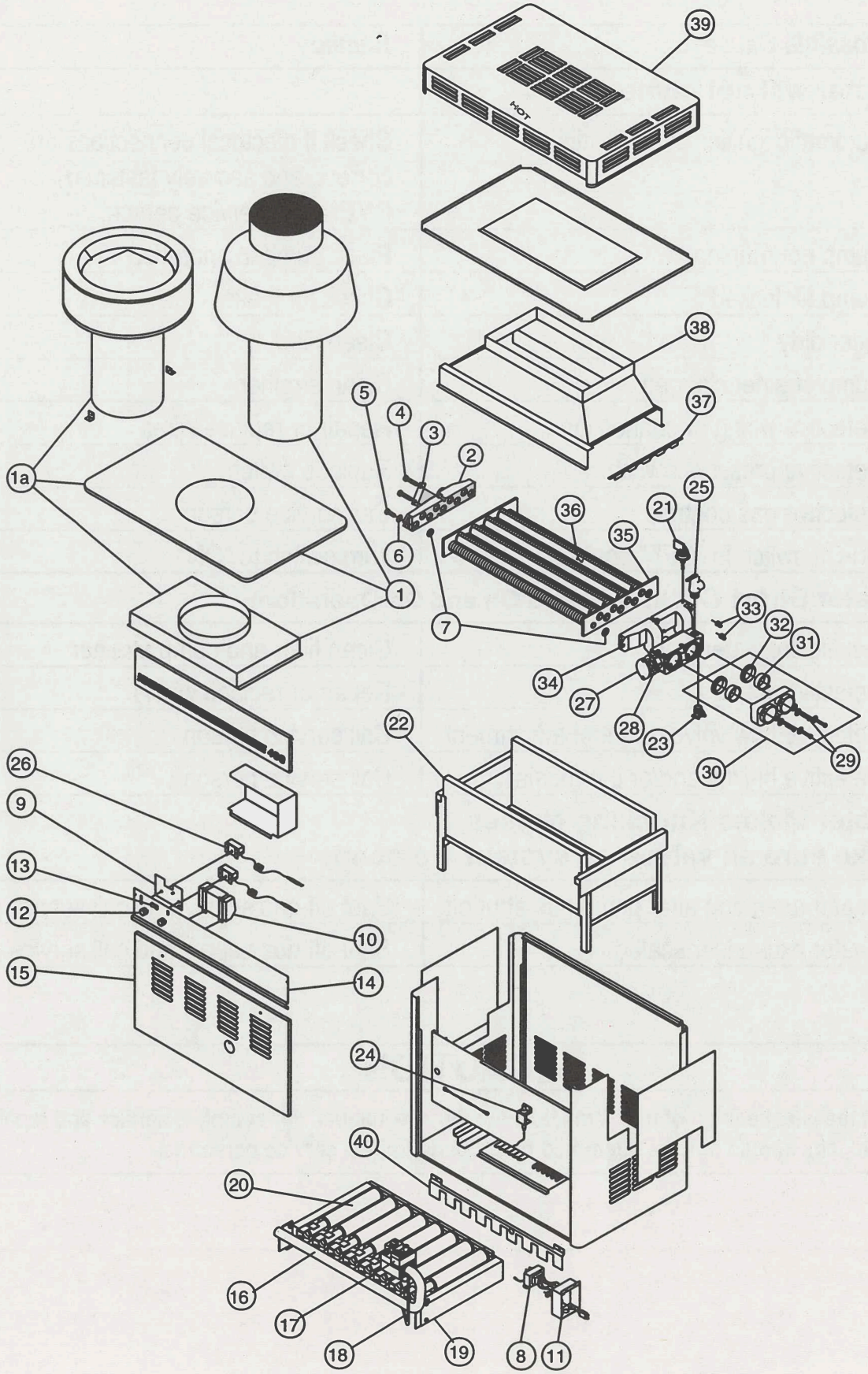
Troubleshooting - General

Possible Cause	*Remedy*
Heater will not come on	
Automatic ignition system fails	Check if electrical connections are correct and securely fastened – If YES, call service person.
Pump not running	Place pump in operation
Pump air locked	Check for leaks
Filter dirty	Clean filter
Pump strainer clogged	Clean strainer
Defective wiring or connection	Repair or replace wires
Defective pressure switch	Replace switch
Defective gas controls	Call service person
On-Off switch in "OFF" position	Turn switch to "ON"
Heater Short Cycling (Rapid On and Off Operation)	
Insufficient water flow	Clean filter and pump strainer
Defective wiring	Repair or replace wiring
Defective flow valve or out of adjustment	Call service person
Defective hi-limit and/or thermostat	Call service person
Heater Makes Knocking Noises, Make sure all valves on system are open	
Heater operating after pump has shut off	Shut off gas supply and call service person
Heater exchanger scaled	Shut off gas supply and call service person

⚠CAUTION

Please consult the latest edition of the "MiniMax Plus Service Manual" for complete service and repair instructions. Repairs should only be attempted by properly trained service personnel.

MINIMAX PLUS HEATER - ALL MODELS



MiniMax Plus (Only) Parts List

ITEM	DESCRIPTION	QTY	150	195/200	250	300	350	400
1	Vent kit assy. (indoor)	1	460227	406228	460230	460231	460233	460234
1a	Vent kit assy. (outdoor)	1	460237	460222	460223	460224	460225	460226
2	Return header	1	070994	070994	070994	070994	070994	070994
3	Bracket washer	2	074216	074216	074216	074216	074216	074216
4	Bolt HH 3/8" x 2"	4	073739	073739	073739	073739	073739	073739
5	Bolt 3/8" - 16 x 1 1/2"	4	070416	070416	070416	070416	070416	070416
6	Washer 3/8" ID 1" OD	4	072180	072180	072180	072180	072180	072180
7	Tube seal gasket	18	070951	070951	070951	070951	070951	070951
8	Transformer - w/circuit breaker - dual voltage	1	471360	471360	471360	471360	471360	471360
9	Thermostat circuit board - IID	1	470179	470179	470179	470179	470179	470179
10	Module natural gas	1	073584	073584	073584	073584	073584	073584
	Module propane gas	1	073585	073585	073585	073585	073585	073585
11	Junction Box	1	470122	470122	470122	470122	470122	470122
12	Thermostat knob	2	470184	470184	470184	470184	470184	470184
13	Switch rocker (single pole & double throw)	1	470186	470186	470186	470186	470186	470186
14	Control panel assy. (complete) - IID Nat	1	470295	470296	470297	470298	470299	470187
	Control panel assy. (complete) - IID Pro	1	470987	470988	470989	470990	470991	470992
	Control panel assy. (complete) - Millivolt	1	471020	471021	471022	471023	471024	471025
15	Door - IID or Millivolt	1	075468	075604	075488	075605	075606	075490
16	Manifold burner	1	070256	075525	070257	075526	075527	070258
17	Gas valve natural - IID	1	073998	073998	073998	073998	073998	073998
	Gas valve propane- IID	1	073999	073999	073999	073999	073999	073999
	Gas valve natural - Millivolt	1	075457	075457	075457	075457	075457	075457
	Gas valve propane - Millivolt	1	075458	075458	075458	075458	075458	075458
18	Pilot tube - IID	1	075191	075191	075192	075192	075193	075193
	Pilot tube - Millivolt		075471	075471	075471	075471	075471	075471
19	Burner tray assy. natural (complete) - IID	1	073752	075499	073751	075500	075501	073750
	Burner tray assy. propane (complete) - IID	1	073906	075508	073905	075509	075510	073904
	Burner tray assy. natural (complete) - Millivolt	1	075493	075496	075494	075497	075498	075495
	Burner tray assy. propane (complete) - Millivolt	1	075502	075505	075503	075506	075507	075504
20	Burner		2 EA. 070230	3 EA. 070230	4 EA. 070230	5 EA. 070230	6 EA. 070230	7 EA. 070230
20a	Burner with Pilot Bracket	1	470550	470550	470550	470550	470550	470550
21	Pressure switch	1	470190	470190	470190	470190	470190	470190
22	Combustion chamber assy. (complete)	1	073858	075586	073857	075587	075588	073856
23	Valve drain 3/4"	1	072134	072134	072134	072134	072134	072134
24	Presslite igniter assy.	1	075459	075459	075459	075459	075459	075459
25	Valve relief 3/4" 50# - ASME or Local Code	1	072138	072138	072138	072138	072138	072138
26	Thermostat Millivolt	1	072022	072022	072022	072022	072022	072022
27	Flow valve assy., Standard (complete)	1	471424	471424	471424	471424	471424	471424
	Flow valve assy., ASME (complete)	1	073989	073989	073989	073989	073989	073989
28	Flow valve gasket	4	074015	074015	074015	074015	074015	074015
29	Bolt 3/8" - 16 x 2 1/2	2	075492	075492	075492	075492	075492	075492
30	Quick flange Kit	1	075284	075284	075284	075284	075284	075284

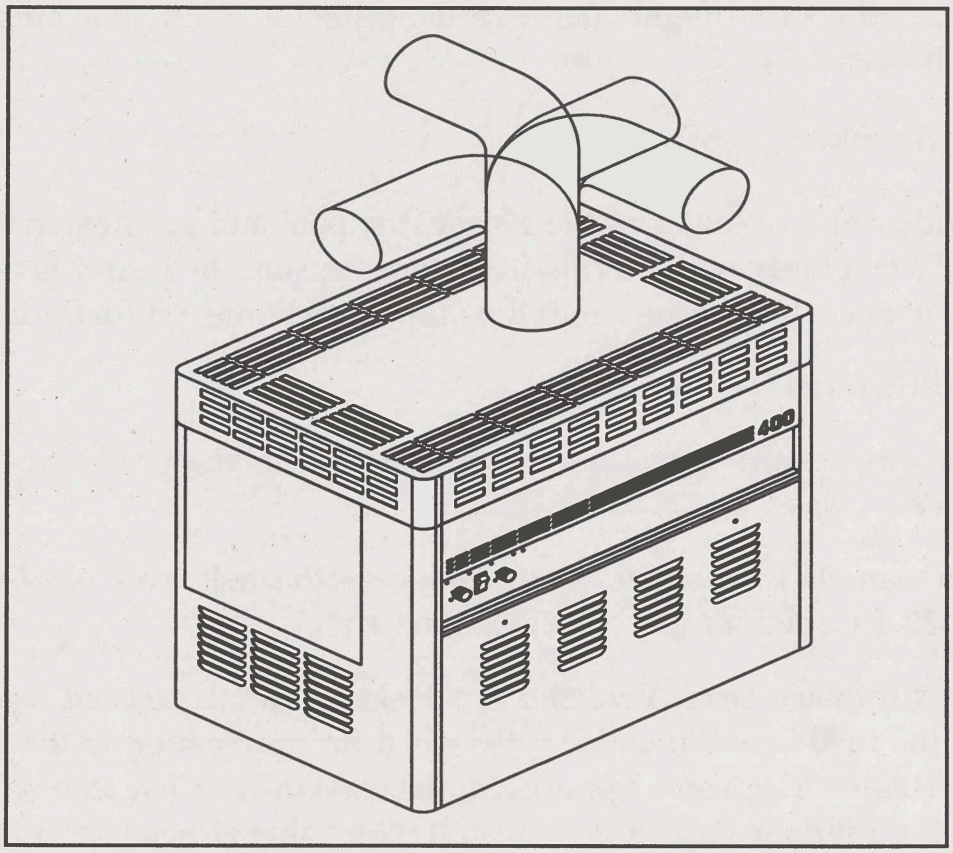
MiniMax Plus (Only) Parts List, *contd.*

ITEM	DESCRIPTION	QTY	150	195/200	250	300	350	400
31	Bushing in/out Lexan	2	070544	070544	070544	070544	070544	070544
32	Sleeve, rubber in/out 2"	2	071895	071895	071895	071895	071895	071895
	Sleeve, rubber in/out 1½"	2	070229	070229	070229	070229	070229	070229
33	Safety Shutoff	2	071017	071017	071017	071017	071017	071017
34	Main header (in/out)	1	070985	070985	070985	070985	070985	070985
35	Heat exchanger (without heads)	1	074452	075628	074451	075629	075630	074074
36	Baffle		8 ea. 070277	8 ea. 075559	8 ea. 070276	8 ea. 075560	16 ea. 075561	16 ea. 070278
37	Baffle hold down (2) baffles on 400	1	073810	073810	073810	073810	073810	073810
38	Flue collector	1	073864	075622	073863	075623	075624	073862
39	Outdoor Top assy.	1	470471	470472	470473	470474	470475	470476
40	Lightback Shield (Natural Gas units only)	1	075783	075784	075785	075786	075787	075788
*** Not Shown**								
*	Plastic mounting bracket		070715	070715	070715	070715	070715	070715
*	Wire Kit - Harness		470965	470965	470965	470965	470965	470965
*	Wire Harness assy.	1	073732	073732	073732	073732	073732	073732
*	Wire Kit - Millivolt		075511	075511	075511	075511	075511	075511
*	Screw 8 x 1/4" HH		071703	071703	071703	071703	071703	071703
*	Screw 8 x 1/2" HH		071698	071698	071698	071698	071698	071698
*	Screw 6 x 1/4"		071716	071716	071716	071716	071716	071716
*	Screw 10 -32 x 1/4"		071659	071659	071659	071659	071659	071659
*	Screw 10-32 x 3/16		075692	075692	075692	075692	075692	075692
*	Bushing 1/2"		070551	070551	070551	070551	070551	070551
*	Therm knob stopper	2	470414	470414	470414	470414	470414	470414
*	Bolt 5/16" - 18 x 3/4'	2	073725	073725	073725	073725	073725	073725
*	Orifice main burner natural		3 ea. N or P 073727	4 ea. N or P 073727	5 ea. N or P 073727	6 ea. N or P 073727	7 ea. N or P 073727	8 ea. N or P 073727
*	Orifice main burner propane		073728	073728	073728	073728	073728	073728
*	Pilot - natural - IID	1	471204	471204	471204	471204	471204	471204
*	Pilot - propane - IID	1	471205	471205	471205	471205	471205	471205
*	Pilot - natural - millivolt	1	471292	471292	471292	471292	471292	471292
*	Pilot - propane - millivolt	1	471291	471291	471291	471291	471291	471291
*	Pilot - generator	1	071515	071515	071515	071515	071515	071515
*	Thermal cutoff	1	075173	075173	075173	075173	075173	075173
*	Thermistor (probe) complete	1	470180	470180	470180	470180	470180	470180

PowerMax Pool & Spa Heater

OPERATION & INSTALLATION MANUAL

(APPENDIX)



INSTALLER: AFFIX THESE INSTRUCTIONS TO OR ADJACENT TO POOL & SPA HEATER

DESIGN AMERICAN GAS ASSOCIATION CERTIFIED

APPROVED

purex triton

Pool and Spa Systems

PacFab, Inc.
Corporate Headquarters: 1620 Hawkins Ave., Sanford, NC 27330 • (919) 774-4151
Western Operations: 10951 West Los Angeles Ave., Moorpark, CA 93021 • (805) 523-2400

PowerMax
Pool and Spa Heater

INTRODUCTION

This manual provides information for the proper installation, operation and maintenance of the PowerMax pool and spa heater. Please read these installation and operation instructions thoroughly before attempting installation or operation of your pool and spa heater.

GENERAL SPECIFICATION

...For the installer and operator of the PowerMax pool and spa heater. The manufacturer's warranty may be void if, for any reason, the heater is improperly installed and/or operated. Be sure to follow the instructions set forth in this manual.

CODE REQUIREMENTS

The installation must conform with local codes or in the absence of local codes with the latest national fuel Gas Code, ANSI Z223.1.

Installation in Canada to be made in accordance with the latest CAN/CGA-B149.1 OR .2 and CSA C22.1 Canadian Electric Code part 1.

The PowerMax Induced Draft Pool and Spa Heater is a fan assisted balanced flue gas combination, the field installation kit is designed for application to the PurexTriton Pool and Spa Heater Electronic Ignition Models 150 to 400. The PowerMax is approved for both indoor and outdoor installation using either natural gas or propane. The unit operates in both vertical and horizontal reduced vent pipe locations, in both the new and existing installations, and for applications such as through the (side) wall venting.

MODEL NO.	INPUT MBH	MINIMUM DISCHARGE DIA (Inches)
150	150	3
200	200	3
250	250	4
300	300	4
350	350	4
400	400	4

Table 1.

MOUNTING ASSEMBLY

Follow these instructions if the PowerMax venting system was purchased as an assembly kit.

1. Remove the vent kit assembly (indoor).
2. Mount the plenum assembly on the flue collector top using the screw provided.
3. Connect the wire harness to the heater control box. Follow the instructions on page 5.
4. Mount the new top on the top of the heater. Using a #28 drill bit to drill the four holes on the right side of the heater for the mounting screws. The front and back side of the top will snap into the heater with no screws.

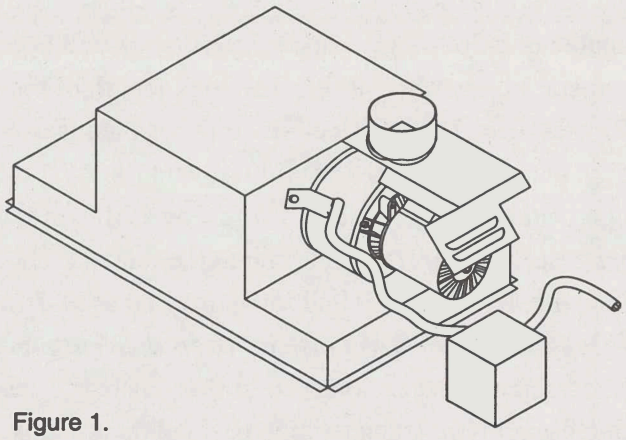


Figure 1.

DESCRIPTION OF SYSTEM OPERATION

SYSTEM OPERATION:

1. Set the thermostat to the lowest setting.
2. Push the power switch off. The electric power supply requirement is:
   - 115 volts 60 Hz, 1 Ph, 1.5 Amp
3. Remove the door.
4. Push in the gas control knob slightly and turn clockwise ↷ to "OFF".
5. Wait (5) minutes to clear out any gas. If you then smell gas **STOP**. Follow the safety information. If you don't smell gas, go to the next step.
6. Turn the knob on the gas control counterclockwise ↶ to "ON".
7. Replace the door.
8. Make sure the pump is running and is primed.
9. Push the power switch on.
10. Set the thermostat to the desired setting.
    - a. Fan motor starts, draft proving switch closes.
    - b. Ignition module energized.
    - c. Check for spark at the gas pilot.
11. The pilot should spark and then ignite, then the main burners will ignite.
12. Heater will operate until the desired temperature is reached.

PRESSURE SWITCH OPERATION

The air pressure switch is a safety device to insure that the blower is operating and has been designed to monitor the vacuum (negative) pressure within the fan housing. The air pressure switch is in the ignition module circuit and the ignition module does not operate unless the switch is closed.

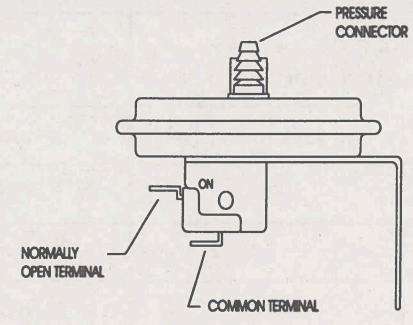


Figure 2. PRESSURE SWITCH

VENTING

The vent pipe must be the same size or larger than what is indicated in Table 1. The PowerMax heaters are capable of a 360-degree discharge rotation and operate with a positive vent static pressure and with a vent gas temperature less than 400 F. The total length of the horizontal run must not exceed an equivalent of 45 feet. For all cases, each 90-degree elbow reduces the maximum horizontal vent run by 8 feet and each 45-degree elbow in the vent run reduces the maximum vent run by 4 feet. See Table 2 for the maximum vent lengths using a 90 degree and 45 degree elbows. The PowerMax induced-draft pool and spa heater uses positive pressure to push flue gases through the vent pipe to the outside. This requires a completely sealed vent system--single wall vent pipe with sealed-seams and joints may be used. ***Flue gases under positive pressure may escape into the dwelling with any cracks or loose joints in the vent pipe, or improper vent installation.*** The vent pipe must be of a sealed-seam construction such as those listed for use with category III appliances. Alternately, single wall or double-wall type B duct which has had duct seams and joints permanently sealed using cements or other suitable means which are rated for use at the flue gas temperatures of 325° F. and are permanent are acceptable. The use of listed thimbles, roof jacks and/or side vent terminals are required; and the proper clearances to combustible materials must be maintained in accordance with type of vent pipe employed- in the absence of a clearance recommendation by the vent pipe manufacturer, the requirements of the Uniform Mechanical Code should be met. ***The ventilation air and combustion air requirements for the PowerMax heaters are identical to the requirements for the Standard MiniMax heaters of the same output capacities and can be found in the main section of the Operation/Installation Manual, page 18.*** It is recommended that vent runs over 18 feet be insulated to reduce condensation related problems and/or the use of a condensate trap in the vent run close to the heater may be necessary in certain installations such as cold climates. The PowerMax is suitable for through-the-wall venting. *(Refer to page A-5, diagram 1.).*

Recommended sources for Side-wall vent hood terminals include: The Field Controls Co. (2308 Airport Road, Kingston, NC 28501, (919) 522-3031) and Tjernlund Products Inc. (1601 Ninth Street, White Bear Lake, MN 55110, (800) 255-4208)--consult manufacturer for model information and availability.

⚠CAUTION

Do NOT combine exhaust vent pipes to a common exhaust vent in multiple unit installations. Run separate vent pipes.

Reduced Maximum Equivalent Vent Run (feet)				
Additional 90° elbows after first elbow			Additional 45° elbows after first elbow	
Quantity	Maximum Length		Quantity	Maximum Length
1 (2 total)	37		1 (2 total)	41
2 (3 total)	29		2 (3 total)	37
3 (4 total)	21		3 (4 total)	33

Table 2.

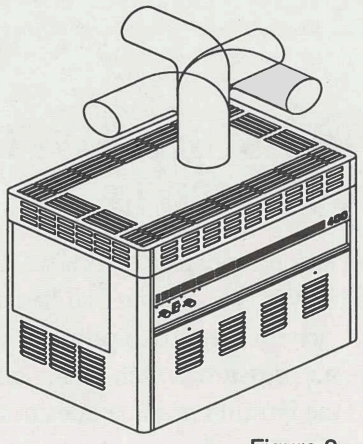
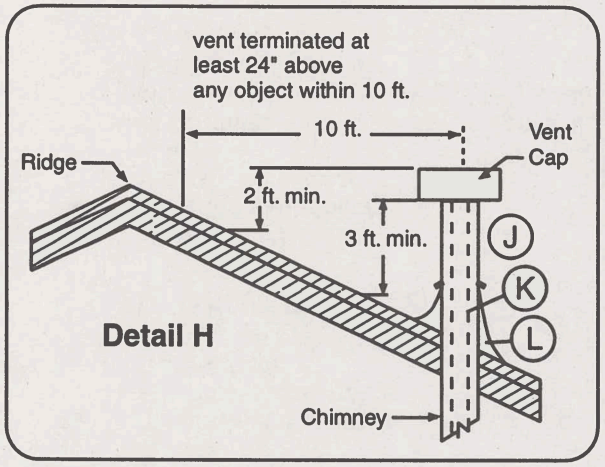


Figure 3.

INDOOR INSTALLATIONS
POWERMAX VENTING GUIDELINES



Vent for roof penetration installations:

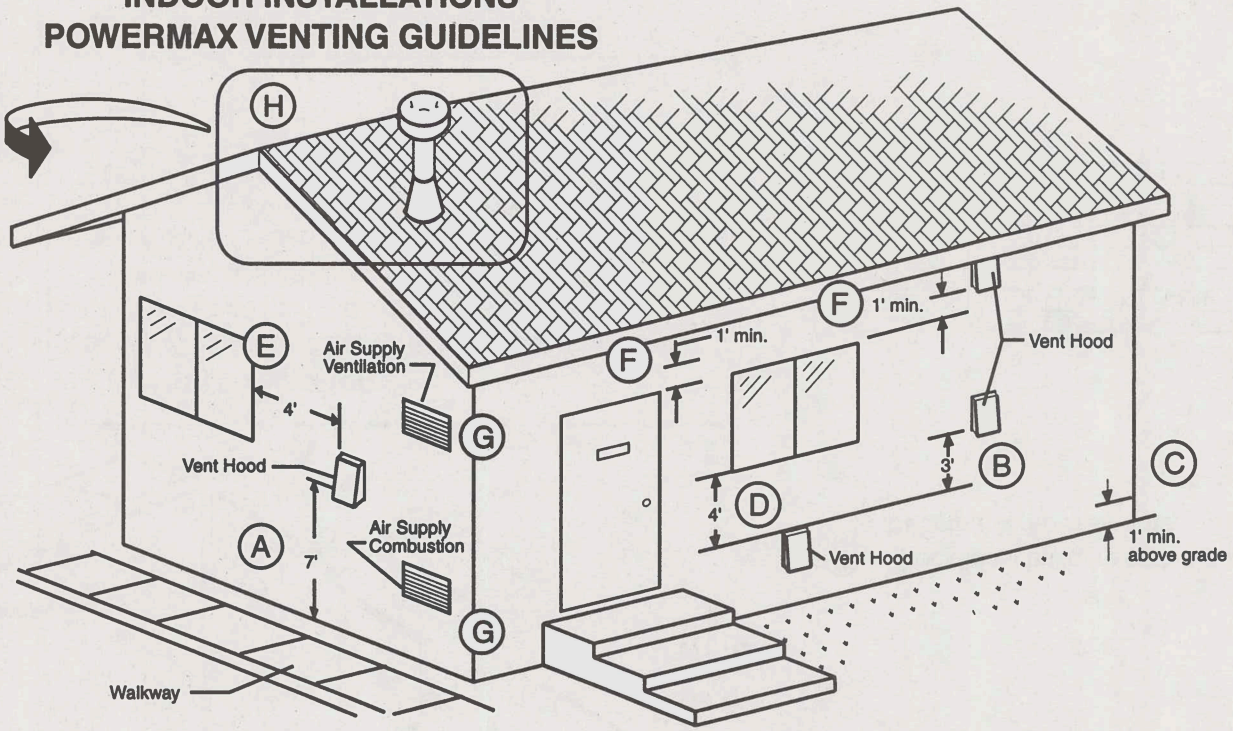
(J) must extend at least 3 ft. higher than the point at which it passes through the roof, or as permitted by local code.

(K) must use a double-wall vent pipe through the roof penetration.

(L) must terminate with an approved (listed) roof jack, storm collar, and vent/weather cap.

Vent pipe extension:

- must be the same diameter as the vent connector.
- must be suitable for use with category III appliances which have flue gas temperatures of less than 400 deg. F.
- may use a single wall vent pipe with permanently sealed seams and joints.



Vent termination for side wall installations:

(A) must be not less than 7 ft. above public walkways.
(B) must be at least 3 ft. above any outside air intake located within a 10 ft. radius.
- **must NOT** be within 3 ft. of an inside corner of the structure.

(C) must be at least 1 ft. above grade.

- must be located the following distances away from any door, window, or gravity air inlet:
  - (D) 4 ft. below
  - (E) 4 ft. horizontally
  - (F) 1 ft. above

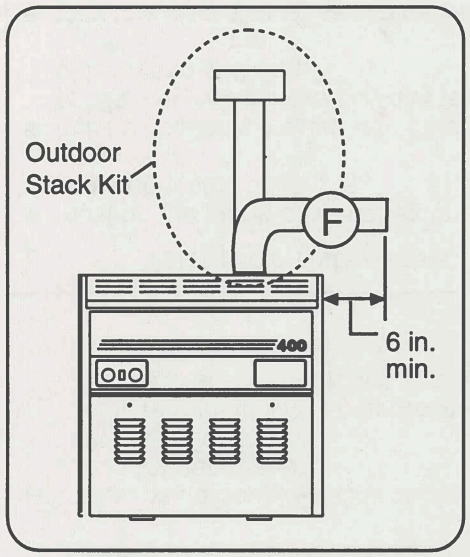
Air Supply

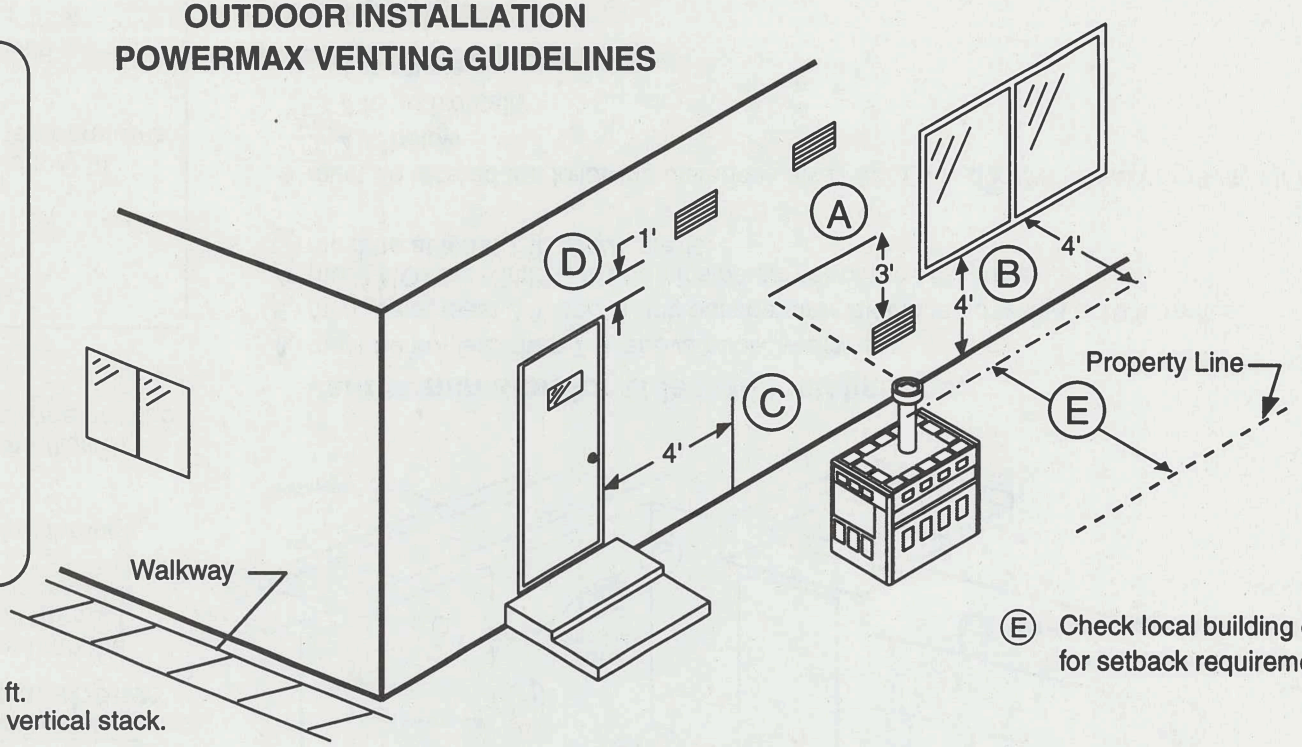
(G) See Air Supply Requirements Tables.

(Tables 10 and 11, on page 19.)

DIAGRAM 1)

OUTDOOR INSTALLATION
POWERMAX VENTING GUIDELINES





The Vent:

- Must extend a minimum of 2 ft. above the vent connector for vertical stack.
- Terminate with a listed vent/weather cap for a vertical stack, not required for a horizontal stack.

(F) Optional Horizontal Venting.

The Vent Pipe:

- Must be the same diameter as the vent connector.
- Must be suitable for use with Category III Appliances which have flue gas temperatures of less than 400 deg. F.

Vent Termination:

★ Must be not less than 7 ft. above public walkways.

(A) Must be at least 3 ft. above any forced air inlet located within a 10 ft. radius.

★ Must be located the following distances away from any door, window, or gravity air inlet:

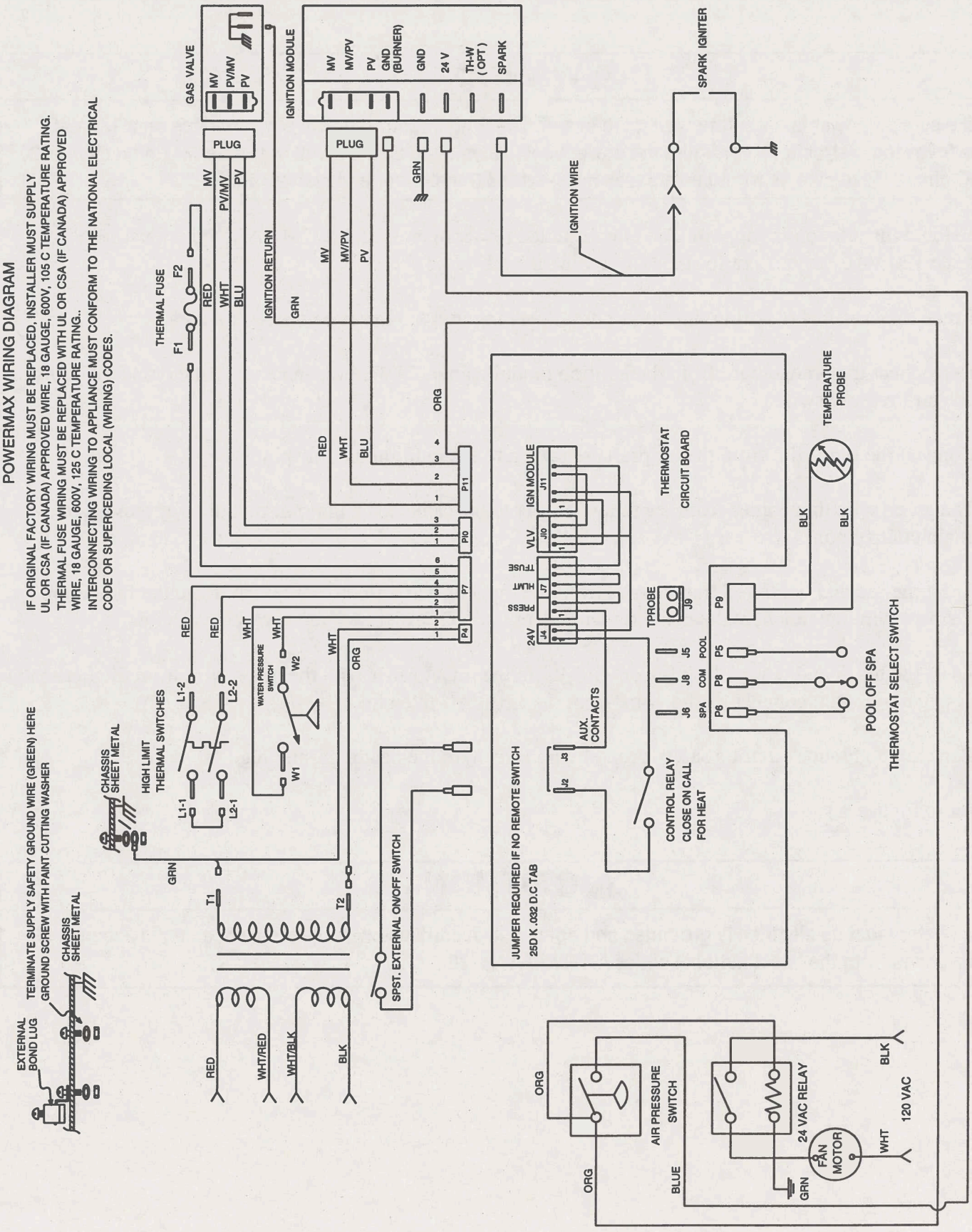
(B) 4 ft. below, or
(C) 4 ft. horizontally, or
(D) 1 ft. above

(E) Check local building codes for setback requirements.

POWERMAX OUTDOOR STACK KITS		
MODEL	STACK DIA.	KIT MODEL
PMX 150	3"	471395
PMX 200	3"	471395
PMX 250	4"	471396
PMX 300	4"	471396
PMX 350	4"	471396
PMX 400	4"	471396

(DIAGRAM 2)

PowerMax Electronic Ignition Wiring Diagram



INSTRUCTION FOR WIRING A POWERMAX INDUCED DRAFT ASSEMBLY TO A POOL HEATER WITH IID IGNITION

⚠ WARNING

Make sure all power is off before wiring the heater. The Power vent assembly only operates on a 120 VAC. The following instructions configure the power vent assembly to operate with the PowerMax on a single 120 VAC circuit. Take care as wiring errors may burn-out the transformer and blower motor.

If the Field installation is supported and the installed heater operates from 230 VAC, there must be a separate 120 VAC service ran for the Power vent assembly.

1. Route the PowerMax wiring through a corner opening into the lower compartment area.

2. Disconnect the orange wire from the ignition module pin 6 (24V) and connect it to the orange wire from the air pressure switch.

3. Connect the blue wire from the air pressure switch to the ignition module pin 6 (24V).

4. The green wire that comes from the relay connect to the same place ignition module is grounded in the main control box.

5. Twist the red and white/red tracer wires from the transformer with the white wire from the fan motor. Using a wire nut, connect the common wire from the 120 VAC line circuit with these wires.

6. Twist the black and white/black tracer wires from the transformer with the black wire from the fan motor. Using a wire nut, connect the hot wire from the 120 VAC line circuit with these wires.

7. Connect the branch circuit's safety ground wire (green) to the heater ground lug.

(Refer to Figure 4.)

⚠ CAUTION

The heater must be electrically grounded and bonded in accordance with the local codes or, in absence of local codes, with the latest national codes ANSI/NFPA No. 70.

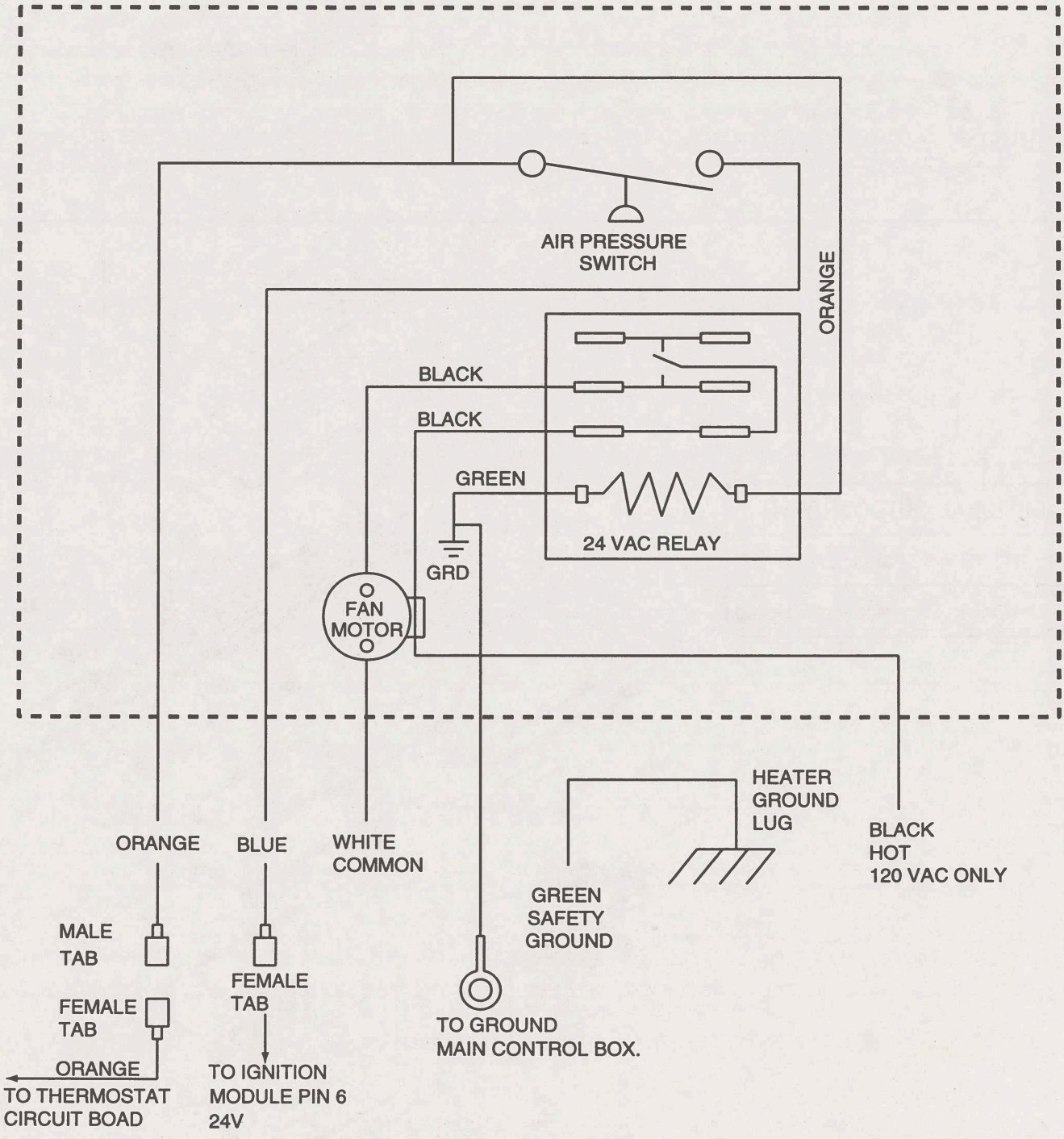
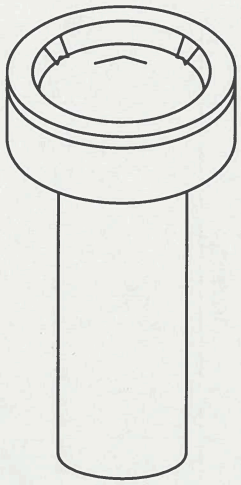
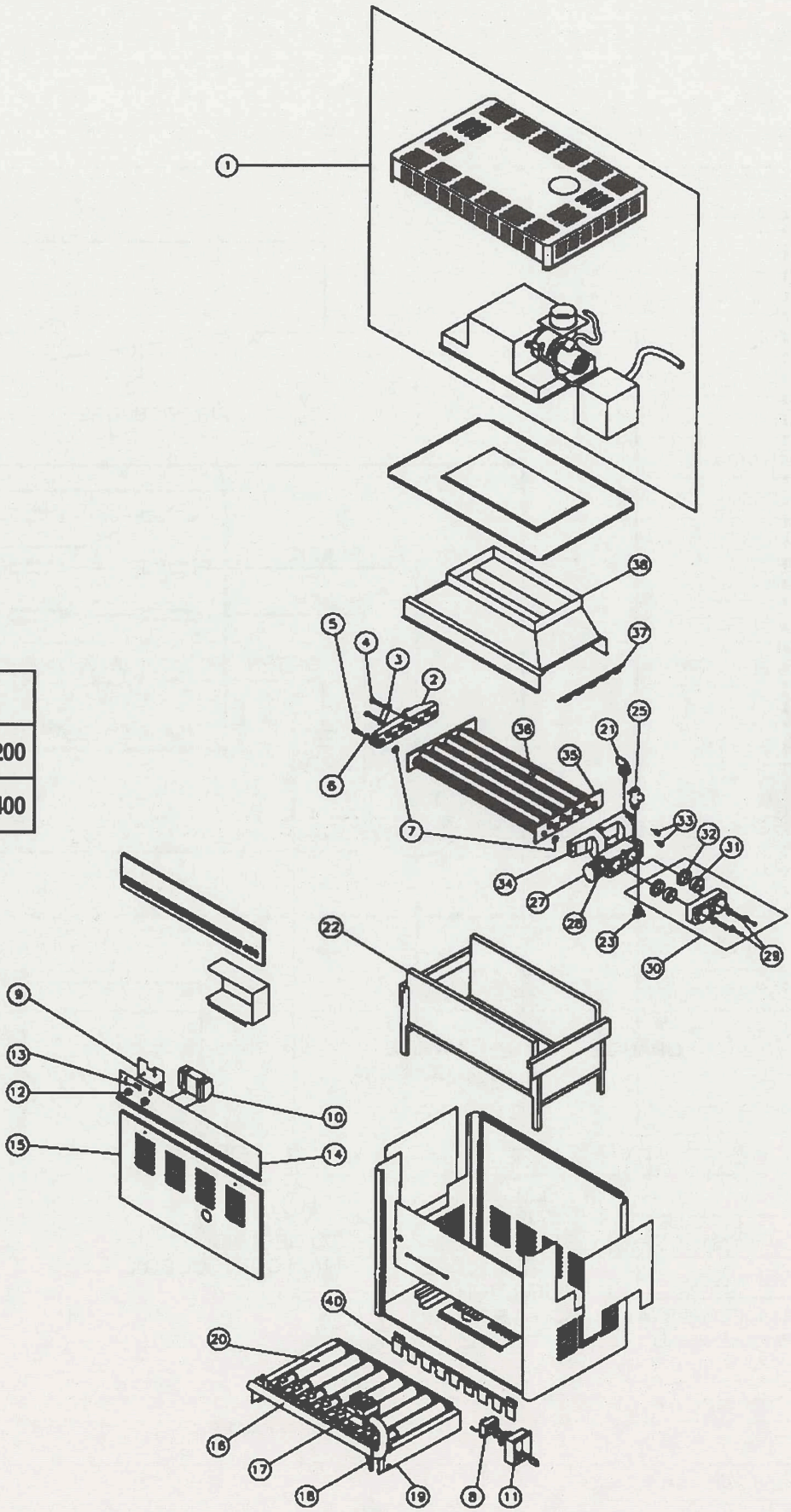

AIR PRESSURE
SWITCH
ORANGE
BLACK
BLACK
GREEN
24 VAC RELAY
GRD
FAN
MOTOR
HEATER
GROUND
LUG
BLACK
HOT
120 VAC ONLY
ORANGE
BLUE
WHITE
COMMON
GREEN
SAFETY
GROUND
MALE
TAB
FEMALE
TAB
FEMALE
TAB
ORANGE
TO THERMOSTAT
CIRCUIT BOAD
TO IGNITION
MODULE PIN 6
24V
TO GROUND
MAIN CONTROL BOX.

Figure 4.

POWERMAX HEATER - ALL MODELS



OPTIONAL OUTDOOR VENT	
471400	Models 150 - 200
471401	Models 250 - 400



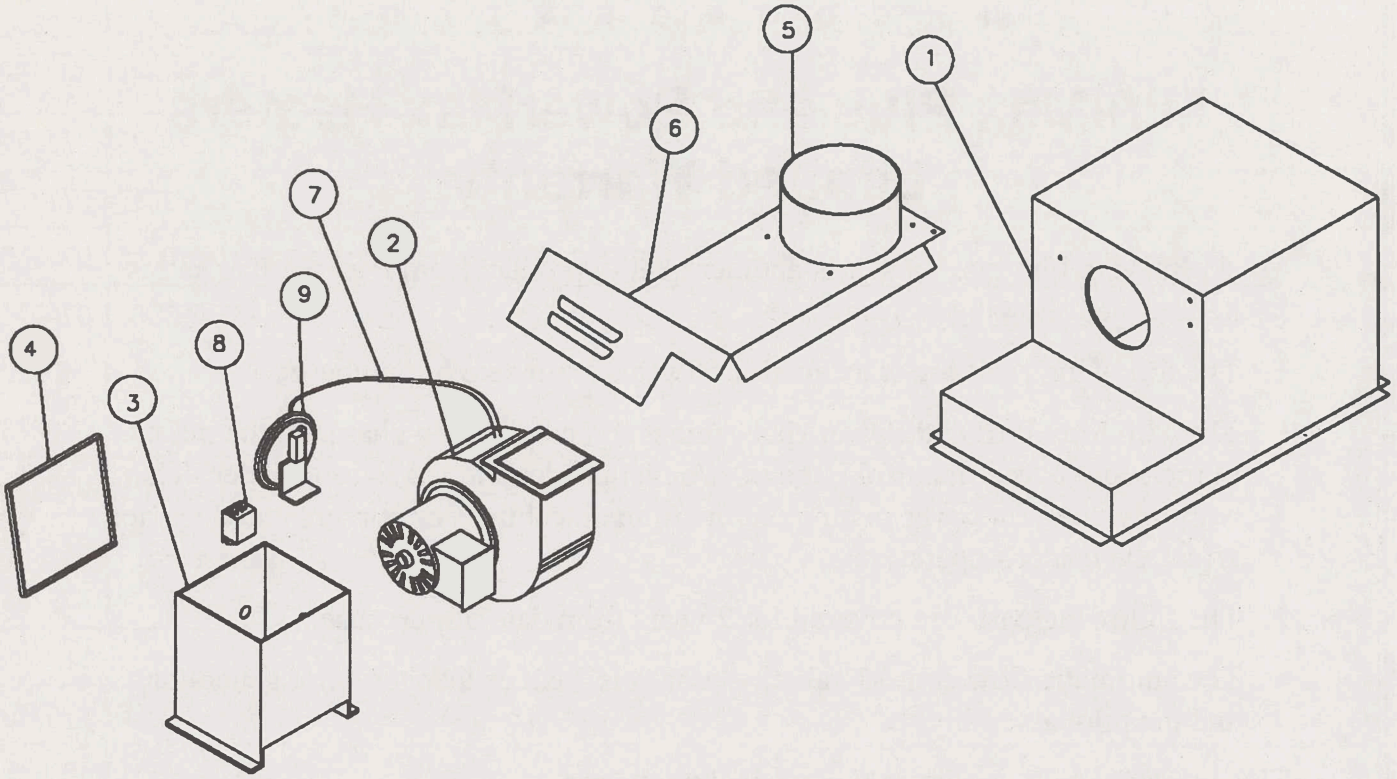
PowerMax Heater (Only) Parts List

ITEM	DESCRIPTION	QTY	150	195/200	250	300	350	400
1	PowerMax Vent Kit (complete)* (Power Max Vent replacement parts detailed in PowerMax Appendix, **A-13**)	1	460048	460049	460050	460051	460052	460221
2	Return header	1	070994	070994	070994	070994	070994	070994
3	Bracket washer	2	074216	074216	074216	074216	074216	074216
4	Bolt HH 3/8" x 2"	4	073739	073739	073739	073739	073739	073739
5	Bolt 3/8" - 16 x 1 1/2"	4	070416	070416	070416	070416	070416	070416
6	Washer 3/8" ID 1" OD	4	072180	072180	072180	072180	072180	072180
7	Tube seal gasket	18	070951	070951	070951	070951	070951	070951
8	Transformer - w/circuit breaker - dual voltage	1	471360	471360	471360	471360	471360	471360
9	Thermostat circuit board - IID	1	470179	470179	470179	470179	470179	470179
10	Module natural gas	1	073584	073584	073584	073584	073584	073584
	Module propane gas	1	073585	073585	073585	073585	073585	073585
11	Junction Box	1	470122	470122	470122	470122	470122	470122
12	Thermostat knob	2	470184	470184	470184	470184	470184	470184
13	Switch rocker (S.P.D.T.)	1	470186	470186	470186	470186	470186	470186
14	Control panel assy. (complete) - IID Nat	1	470388	470389	470390	470391	470392	470393
	Control panel assy. (complete) - IID Pro	1	471039	471040	471041	471042	471043	471044
15	Door - assy.	1	075468	075604	075488	075605	075606	075490
16	Manifold burner	1	070256	075525	070257	075526	075527	070258
17	Gas valve natural - IID	1	073998	073998	073998	073998	073998	073998
	Gas valve propane- IID	1	073999	073999	073999	073999	073999	073999
18	Pilot tube - IID	1	075191	075191	075192	075192	075193	075193
19	Burner tray assy. natural (complete) - IID	1	073752	075499	073751	075500	075501	073750
	Burner tray assy. propane (complete) - IID	1	073906	075508	073905	075509	075510	073904
20	Burner		2 EA. 070230	3 EA. 070230	4EA. 070230	5 EA. 070230	6 EA. 070230	7 EA. 070230
20a	Burner with Pilot bracket	1	470550	470550	470550	470550	470550	470550
21	Pressure switch	1	470190	470190	470190	470190	470190	470190
22	Combustion chamber assy. (complete)	1	073858	075586	073857	075587	075588	073856
23	Valve drain 3/4"	1	072134	072134	072134	072134	072134	072134
25	Valve relief 3/4" 50# - ASME or Local Code	1	072138	072138	072138	072138	072138	072138
27	Flow valve assy., Standard (complete)	1	471424	471424	471424	471424	471424	471424
	Flow valve assy., ASME (complete)	1	073989	073989	073989	073989	073989	073989
28	Flow valve gasket	4	074015	074015	074015	074015	074015	074015
29	Bolt 3/8" - 16 x 2 1/2	2	075492	075492	075492	075492	075492	075492
30	Quick flange Kit	1	075284	075284	075284	075284	075284	075284

PowerMax Heater (Only) Parts List, *contd.*

ITEM	DESCRIPTION	QTY	150	195/200	250	300	350	400
31	Bushing in/out Lexan	2	070544	070544	070544	070544	070544	070544
32	Sleeve, rubber in/out 2"	2	071895	071895	071895	071895	071895	071895
	Sleeve, rubber in/out 1½"	2	070229	070229	070229	070229	070229	070229
33	Safety Shutoff	2	071017	071017	071017	071017	071017	071017
34	Main header (in/out)	1	070985	070985	070985	070985	070985	070985
35	Heat exchanger (without heads)	1	074452	075628	074451	075629	075630	074074
36	Baffle		8 ea. 070277	8 ea. 075559	8 ea. 070276	8 ea. 075560	16 ea. 075561	16 ea. 070278
37	Baffle hold down (2) baffles on 350, 400	1	073810	073810	073810	073810	073810	073810
38	Flue collector	1	073864	075622	073863	075623	075624	073862
40	Lightback Shield (Natural Gas units only)	1	075783	075784	075785	075786	075787	075788
*** Not Shown**								
*	Plastic mounting bracket		070715	070715	070715	070715	070715	070715
*	Wire Kit - Harness (gas valve) IID		470965	470965	470965	470965	470965	470965
*	Wire Kit - Harness (control box) IID		073732	073732	073732	073732	073732	073732
*	Screw 8 x 1/4" HH		071703	071703	071703	071703	071703	071703
*	Screw 8 x 1/2" HH		071698	071698	071698	071698	071698	071698
*	Screw 6 x 1/4"		071716	071716	071716	071716	071716	071716
*	Screw 10 - 32 x 1/4"		071659	071659	071659	071659	071659	071659
*	Screw 10 - 32 x 3/16"		075692	075692	075692	075692	075692	075692
*	Bushing 1/2"		070551	070551	070551	070551	070551	070551
*	Therm knob stopper	2	470414	470414	470414	470414	470414	470414
*	Bolt 5/16" - 18 x 3/4"	2	073725	073725	073725	073725	073725	073725
*	Orifice main burner natural		3 ea. N or P 073727	4 ea. N or P 073727	5 ea. N or P 073727	6 ea. N or P 073727	7 ea. N or P 073727	8 ea. N or P 073727
*	Orifice main burner propane		073728	073728	073728	073728	073728	073728
*	Pilot - natural - IID	1	471204	471204	471204	471204	471204	471204
*	Pilot - propane - IID	1	471205	471205	471205	471205	471205	471205
*	Thermal cutoff	1	075173	075173	075173	075173	075173	075173
*	Thermistor (probe) complete	1	470180	470180	470180	470180	470180	470180

PowerMax Assembly



PowerMax Assembly Parts List

ITEM	DESCRIPTION	QTY	150	200	250	300	350	400
1	Plenum	1	470139	470140	470141	470142	470143	470144
2	Blower combustion	1	470008	470008	470007	470007	470007	470007
3	Control box side & base	1	470331	470331	470331	470331	470331	470331
4	Control box top	1	470337	470337	470337	470337	470337	470337
5	Adapter ring	1	470336	470336	470326	470326	470326	470326
6	Adapter base	1	470334	470334	470325	470325	470325	470325
7	Silicone rubber tube	1	470328	470328	470328	470328	470328	470328
8	Relay	1	470010	470010	470010	470010	470010	470010
9	Pressure Switch Sea Level to 4000 ft.	1	470009	470009	470009	470009	470009	470009
9	Pressure Switch High Altitude Sea Level 4000 - 8000 ft.	1	471428	471428	471428	471428	471428	471428

PacFab

INCORPORATED

MiniMax Plus and PowerMax Heaters Limited Warranty

Your MiniMax Plus pool heater is another quality product from PacFab, Inc. and is backed by the following warranty.

1. The following parts are warranted for 5 years from date of purchase:

   The MiniMax Plus and PowerMax cabinet and combustion chamber, the main burners and burner manifold, the inlet/outlet header and the return header. This warranty does not cover rusting or corrosion on cabinets or burners that does not affect the heater's operation.

2. The following parts are covered for 2 years from date of purchase:

   The automatic flow control valve, all controls, heat exchanger, pilot generator and the pilot assembly.

This warranty only applies to the original purchaser.

3. This warranty shall not apply to any units or parts which have been subject to accident, negligence, alteration, abuse, misapplication or misuse.

The above warranty applies only if the heater is installed and operated in complete compliance with the installation and operation manual provided with each unit. Copies of this manual are available by writing to PacFab, Inc., at the address below.

PacFab, Inc. assumes no liability except for the repair or replacements of parts as specified above. Ship defective parts or equipment along with serial number and purchase date, transportation prepaid to the address below. Purchaser shall be responsible for freight charges for return of merchandise to purchaser. Some states do not allow exclusion or limitation of incidental or consequential damages so the above may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

HEATER SERIAL NUMBER

(Please Fill In)

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